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AMERICAN RIFLEMAN

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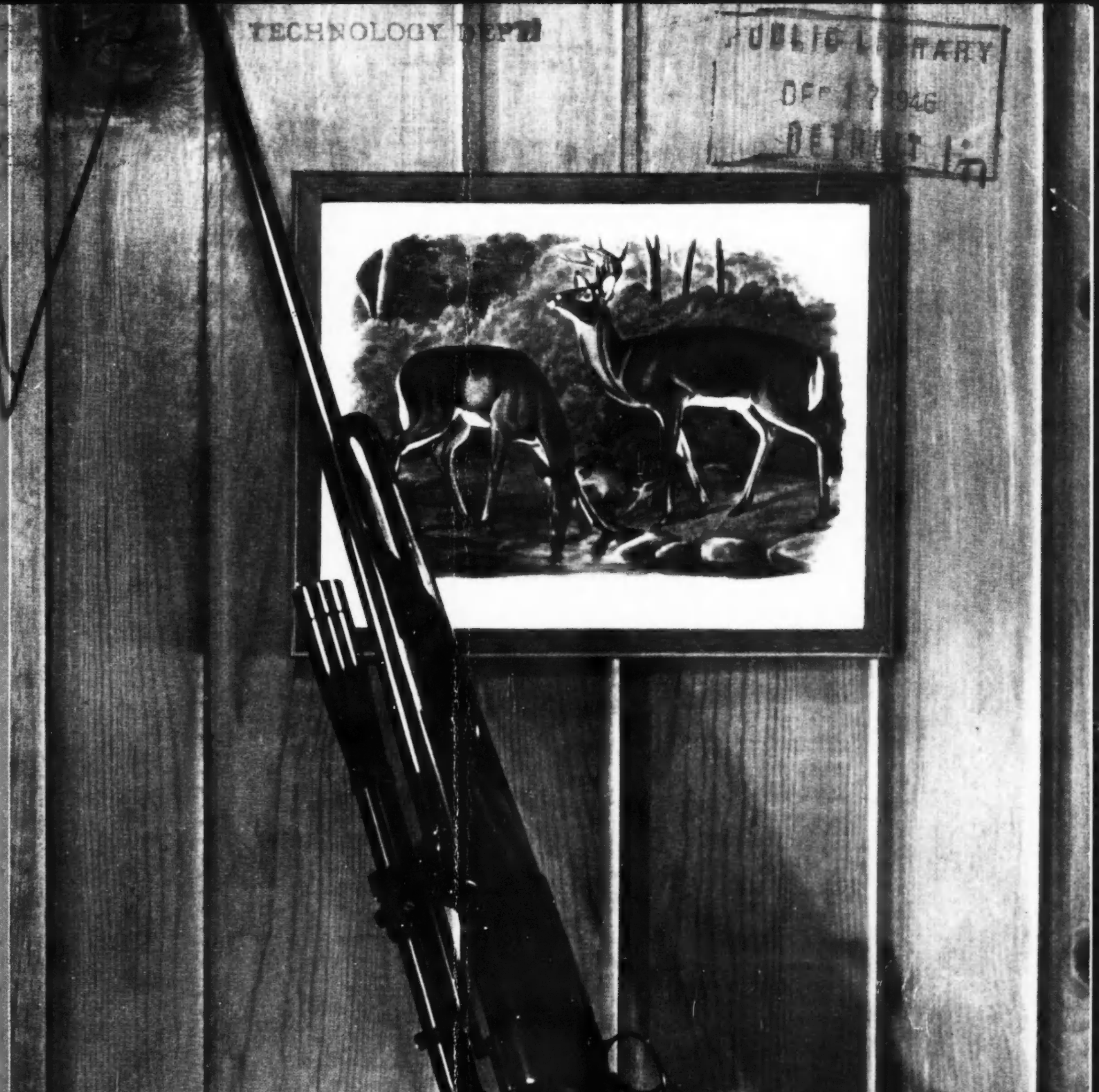

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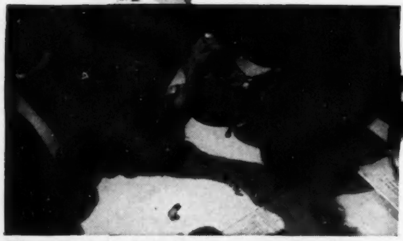

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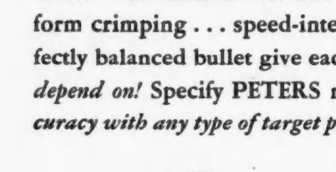

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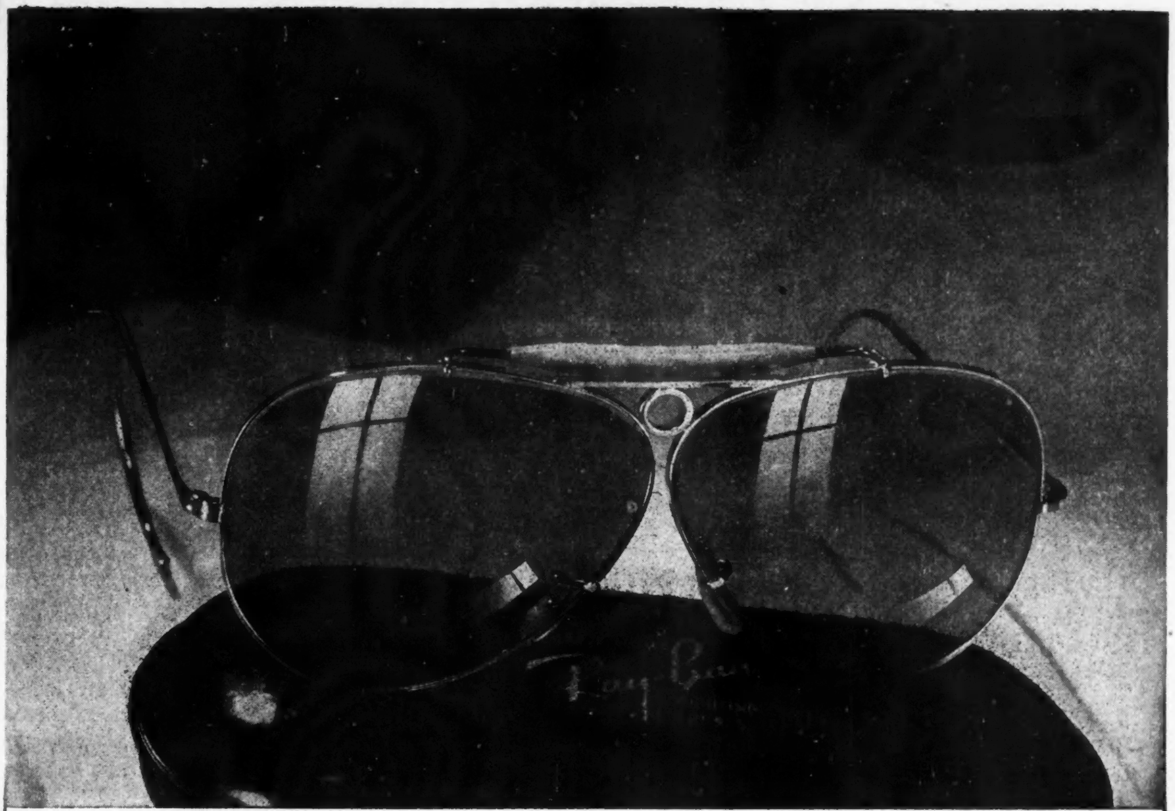

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Open Team Match
Master Class Match, 22 Caliber
Expert Class Match, 22 Caliber
Open Center Fire Slow Fire Match
Open Center Fire Timed Fire Match
Open Team Match
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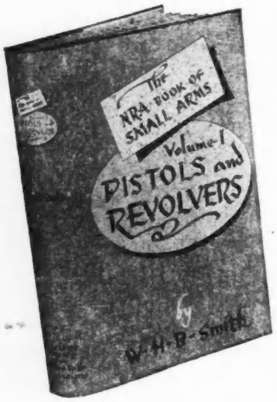
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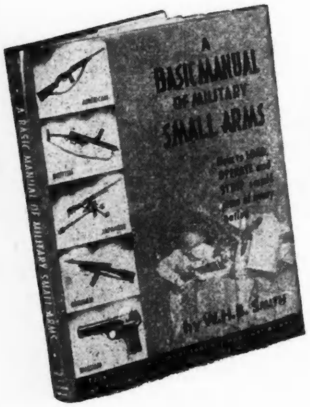
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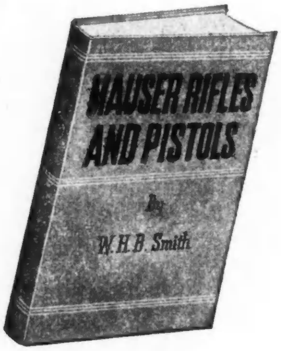
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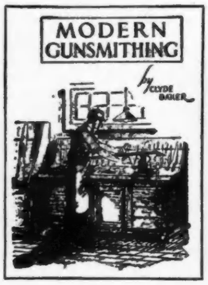
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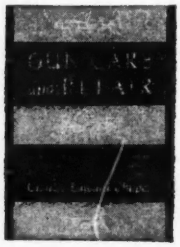
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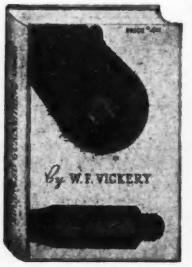
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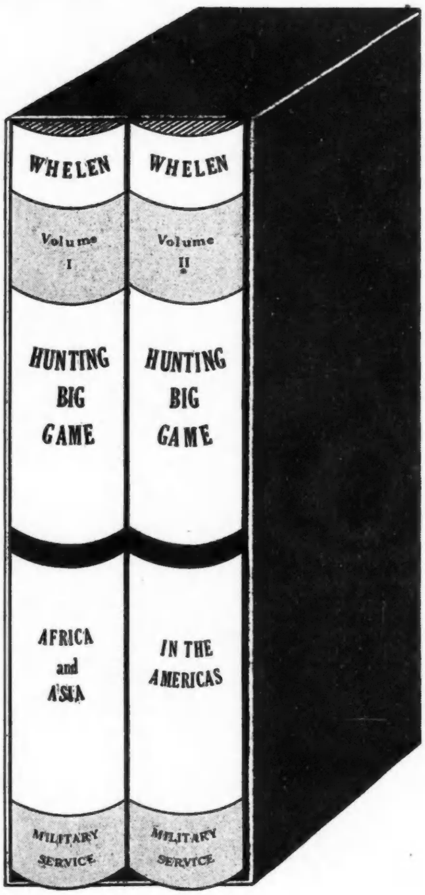
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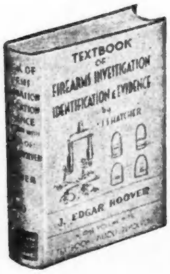
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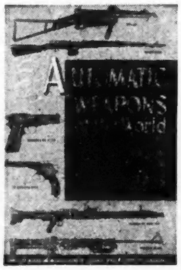
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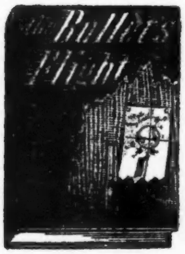
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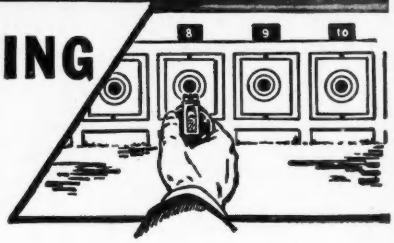

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A Ribbed Barrel for finer balance and greater weight up front

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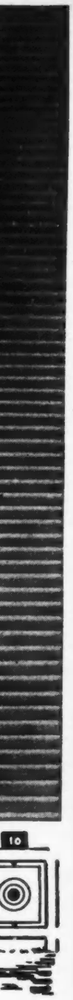

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The
AMERICAN RIFLEMAN

Official Journal of the National Rifle Association of America

VOLUME 94 NUMBER 12

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DECEMBER 1946

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From the Editor:

The other day, in one of those editorial conferences of ours, General Hatcher read a couple of letters from members who had joined us only a few months ago . . . asking about something that must be troubling a lot more of our readers than the two who wrote us about their problem. . . . What these readers had to say was roughly this: "We like THE RIFLEMAN . . . think it's the best in the field, *but* . . . in handling technical subjects, and sometimes subjects not so technical, we're too often left high and dry when we run into a term like Spitzer bullet, or loading density, or resolving power . . . or a flock of others that we aren't too clear about . . . if we know what they mean at all."

☆ ☆ ☆

Those letters started us thinking. Obviously, we couldn't have definitions of words right in the articles themselves, or footnotes all over the magazine. Our glossary had to be concise, and it had to be in one spot every month. Here's what we decided on. . . . Each month, we're going to give a set of advance proofs to two or three people in the editorial offices . . . people who have been selected because of what they *don't* know about the technical end of our shooting game. They'll query any term they don't understand. Based on those marked proofs, we will make up a monthly column . . . a shooter's glossary, to be published as a regular feature. It should be a big help to those new readers of ours . . . and strangely enough, it may not be a bad idea for the seasoned shooter, either . . . our changing vocabulary being what it is. So . . . next month we'll start that column. It's one of the things we've been planning in order to bring THE RIFLEMAN to the point that it can serve all of its readers better than ever, without letting down one or another of the many specialized groups who make up the NRA. It's a big order, but we think it can be done.

☆ ☆ ☆

And speaking of reader interest. . . . During the last few months, our technical staff has kept a record of all Dope Bag queries . . . by subject. That tabulation is interesting: 35 per cent of the 435 letters answered during one two-week period asked about foreign weapons. Gunsmithing was next with twelve per cent, rifles a close third, and fourth was information on Government sales, with eight per cent . . . and so on, down to wildcat cartridges and optics, each with two per cent. It adds up to one more way we can learn what RIFLEMAN readers are interested in.

THE AMERICAN RIFLEMAN

COVER

All of the makings of a perfect rifleman's Christmas . . . a new sporter, complete with fine scope . . . binoculars to go with it . . . and one of John James Audubon's great, century-old prints for that panelled sportsman's den . . . to make a memorable December cover. For the record, the rifle is a brand new Weatherby .270 Magnum, the scope a K 2.5 Weaver with 6X Litschert attachment, and the binoculars are B&L's 'Zephyr-Light' 6x30's. The Kodachrome is a studio shot by Rifleman editor John Scofield. Camera used was a 4x5 Speed Graphic.

PUBLISHED MONTHLY BY THE NATIONAL RIFLE ASSOCIATION OF AMERICA, 1600 RHODE ISLAND AVENUE, WASHINGTON 6, D. C. DOMESTIC RATES (NORTH, SOUTH, AND CENTRAL AMERICA) $3.00 A YEAR; $5.00 FOR TWO YEARS, ELSEWHERE, $3.60 A YEAR; $6.50 FOR TWO YEARS. ENTERED AS SECOND-CLASS MATTER, APRIL 1, 1908, AT THE POST OFFICE AT WASHINGTON, D. C., UNDER ACT OF MARCH 3, 1879. COPYRIGHT, 1946, NATIONAL RIFLE ASSOCIATION OF AMERICA. ALL RIGHTS RESERVED. FOR CHANGE OF ADDRESS, GIVE BOTH NEW AND OLD ADDRESS AS THE LATTER APPEARS ON ADDRESS LABEL.

High Resolve

STORIES are beginning to appear in the newspapers pointing out what a wonderful year for "sport" this year has been. The criterion generally used to establish the "success" of a sport is either the number of paid admissions, the amount of money spent for equipment and travel, or the amount of money wagered. The net result of such publicity is that the average young American is taught to believe that the success of a sport is to be judged principally in terms of *dollars* and the success of the "sportsman" is to be judged by the amount of *money* he is able to spend or to make out of his sport.

When we raise our children in the belief that money is the most important thing, even to sportsmen, can we blame those children if they grow up to place materialism ahead of idealism in *all* their relations with their fellow men?

In our own field of sport we are all too prone to judge the success of the hunting season by the number of hunting licenses sold, the plentitude of game, the number of tons of meat taken by hunters. The game hog is the one most likely to get his picture in the local paper. The most successful "sportsman" in the target shooting game is depicted as the one who has collected the most medals, trophies and cash. When the kids read in the paper that a police officer has been arrested for jack-lighting; when they hear that Uncle Ned's deer was really shot by Uncle Ned's guide; when their shooting coach teaches them how to take every possible advantage of the rules in order to win; can the kid be blamed for thinking that *anything* is all right *if he can get away with it?*

The problem is not one of "professional" vs. "amateur" sport. There have been no Olympic Games since World War I which have been free of widely publicized gripes from one or more of the squads complaining about the food, quarters or uniforms which were furnished without cost to the touring "amateurs." The problem is deeper, it is one of *real, ingrained sportsmanship* as opposed to the superficial, synthetic brand which has become too common in America. There are many true sportsmen in the ranks of the "pros" and many who have no conception of true sportsmanship in the ranks of the "amateurs."

The kinds of rabble-rousing demagoguery—the willingness to "dish it out" but the inability to "take it," the insistence on changing rules in the middle of the game because they cramp the style of one team—which have characterized our political, social and economic relations during the entire development period of the generation now becoming voters, are all products of poor training in the fundamentals of good sportsmanship.

The true sportsman has moral as well as physical courage. He enjoys a contest because it is a *contest,* not because he may win a prize. He is humble in victory, prideful in defeat. He tries to win by beating his opponents, not by beating the rules. When he wins, courtesy, not arrogance, is his trademark. He bears no malice toward the rival who has downed him in fair contest.

Most of the problems which have plagued America and the world in 1946 would have been more readily solved had the antagonists applied the simple principles of real sportsmanship to their relationships one with the other.

Let all of us who call ourselves sportsmen make a New Year's resolution that throughout the coming year we will think and act like sportsmen in *all* of our relations with our fellow men; that we will teach our sons and nephews to think and act like sportsmen off the playing field as well as on it; that we will take pride not in having *won* so much as in *how* we have played the game—C. B. L.

IF YOU'RE LOOKING FOR A CHANGE OF PACE—

PART ONE

SHOOTING *the* MUZZLE LOADERS

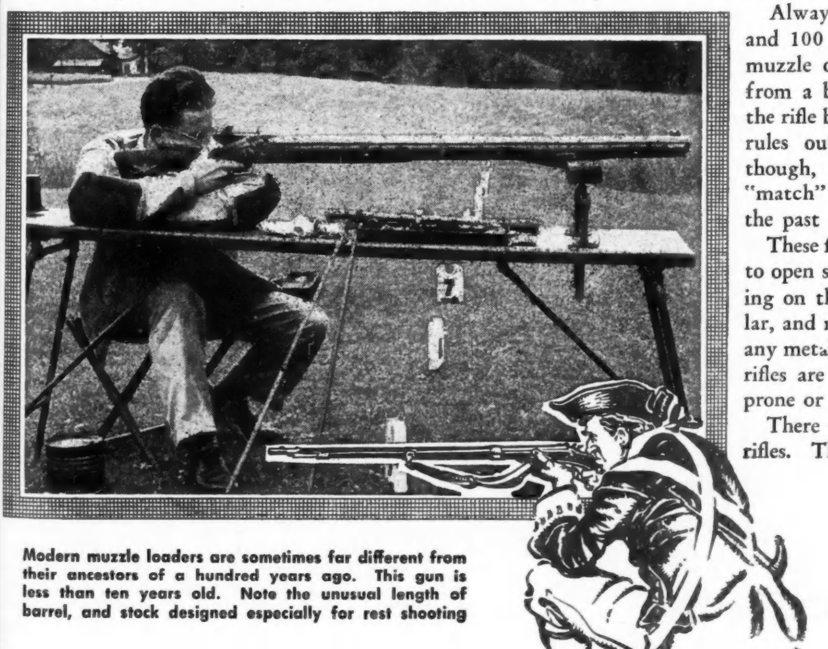
IS AN INTERESTING "NEW" DEVELOPMENT IN THIS POWDER-BURNING BUSINESS

By DON COBLE

T HE CURRENT REVIVAL *of interest in target shooting with the muzzle-loading rifle dates back to about fourteen years ago, when Walter Cline, E. M. Farris, and "Boss" Johnson, among others, laid the groundwork for what is now the National Muzzle Loading Rifle Association. From the few dozen muzzle-gun enthusiasts who turned out for that first match in the early 1930's, has grown an organization numbering nearly 6,000 affiliated with the NMLRA, with headquarters in Portsmouth, Ohio. The big annual shoot of the muzzle-loader clan, on the Association-owned Walter Cline Range at Friendship, Indiana, is as dear to those who burn black powder as are the Camp Perry Matches to devotees of modern rifles and pistols.*

* * *

Relatively few of America's million or so gun enthusiasts have had the opportunity of attending one of today's colorful muzzle-loader shoots. They are common only in certain "centers" of muzzle-loading activity, where clubs have been organized and annual matches sponsored. These centers of activity extend westward from Connecticut to Pennsylvania, Ohio, Indiana, Kentucky, Illinois, Michigan, and California. In addition, many small groups of muzzle-loading riflemen are active all over the United States. Already the number of shooters with an interest in black powder adds up to a surprising figure for so "new" a sport.



Modern muzzle loaders are sometimes far different from their ancestors of a hundred years ago. This gun is less than ten years old. Note the unusual length of barrel, and stock designed especially for rest shooting

The spectator at his first muzzle-loading rifle match will be impressed by the number and variety of rifles in evidence. With as many as several hundred in use, it is unlikely that he will see two guns identical in every detail. Most of them were made in the days when the customer dictated his choice to a gunsmith, and they were built accordingly. This variation and individuality of equipment is one of the most attractive features of muzzle-loader matches today. Within the limits of safety, and sometimes match specifications, anything goes!

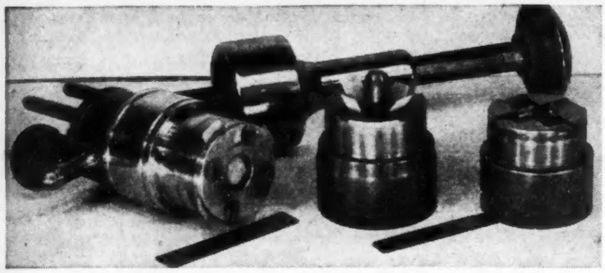
There are several distinct types of muzzle-loading rifle in use for target events, and each is used in events particularly suited to the type. This is another of the appealing features of competition with the muzzle guns. Most shooters own several rifles, and it gives them a chance to fire in nearly all of the standard events scheduled in these contests.

Always most popular are matches from rest at fifty and 100 yards. These may be fired prone with the muzzle of the rifle resting on a suitable object, or from a bench rest. Rules require that the butt of the rifle be supported by some part of the body, which rules out machine-rest shooting. Oddly enough, though, this last was a very popular method of "match" competition in the late percussion period of the past century.

These fifty- and 100-yard matches may be restricted to open sights, or permit any metallic sights, depending on the rules. Open-sight shooting is still popular, and most clubs list an equal number of open and any metallic-sight matches on their programs. Heavy rifles are preferred for rest shooting, whether from prone or from a bench.

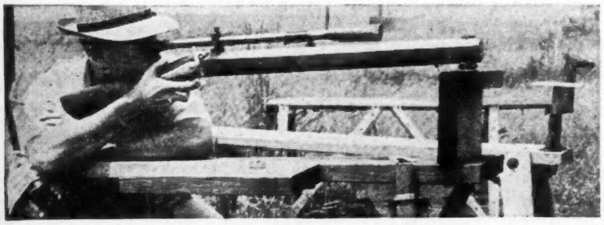
There are two distinct types of these heavy, rest rifles. The most widely used is the round-ball cloth-patch gun with either flintlock or percussion ignition. A lesser-used type is the so-called "slug-gun," which uses a long bullet instead of a round ball, and oiled paper instead of cloth patches.

A description of these bench-rest, round-ball rifles will be of interest to those



False muzzles and bullet starter, used in loading "slug" rifles with long, swaged conical bullet and a two-strip paper patch

readers who have never seen one. The weight ranges in individual specimens from fourteen to thirty pounds, and sometimes even more, and averages about eighteen pounds. Barrel lengths are from thirty-six to forty-eight inches. Bench-rest rifles from eastern Pennsylvania are generally full stocked to the muzzle, while heavy Ohio and Indiana rifles are generally half-stocked, with the forearm extending some fifteen or eighteen inches ahead of the trigger guard. Very little ornament is used on these rifles, in comparison with the elaborate inlay often found on the lighter hunting rifles. The calibers of these heavy, round-ball, target rifles are seldom under .45, and more often from .50 to .55.



"Slug" rifle being fired from bench rest at Canal Fulton, Ohio matches in 1941. These rests are typical of present-day matches

Since the small number of existing rifles was quickly exhausted by the growing ranks of muzzle-gun enthusiasts, an increasing number of new rifles has appeared on the firing lines in recent years. Although many of these new guns follow the general pattern and design of the old-timers, some are radical departures from their ancestors. This is most evident in the design of the stock, and some show a definite influence of the custom-built stock lines of a modern target rifle.

These new rifles may be built entirely by one man, but more often they represent the combined efforts of several. One machinist may drill the bore from solid stock, another plane the barrel to an octagonal shape, and then it may be sent to some old-time gunshop in the hills of southern Ohio or Kentucky for reaming and rifling. Finally, a fourth man may stock the rifle. The two pictures on the following pages are typical of the men who are making these modern rifles.

The reader who is unfamiliar with the muzzle-loading rifle game may wonder why these bench-rest guns are so heavy, and why the barrels are so long and of such large caliber. The answer is that the recoil is far more comfortable with a twenty-pound gun than with one of ten or twelve pounds. Also, a heavy gun holds steadier on a rest than a light one. That extreme barrel length permits a long sighting radius, and seems to give better accuracy with large-caliber round balls than do the shorter barrels. As far as caliber itself is concerned, these heavy round balls are not as readily deflected by wind currents as are smaller, lighter sizes. Under ideal weather conditions a .36 or .40 caliber ball will carry as true as one of .50 or .55 caliber, but let a wind come up, and the big bores will show their advantages.

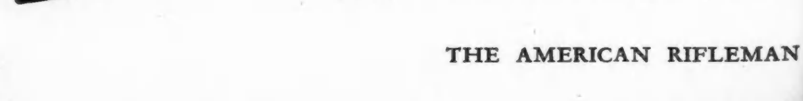
In the old days there was no standard pitch of rifling best suited for the ultimate accuracy of the round ball; nor, for that matter, is there today. The average seems to lie between one turn in forty inches and one turn in sixty. Any pitch within these limits can be relied on to give good results. In the matter of grooves—their number and depth and the relation of groove width and land width to accuracy—every gunsmith had his own pet theories, and made his barrels accordingly.

D. C. Addicks of Rome, Georgia, known to many small-bore riflemen as a maker of record-breaking .22 rifle barrels, was also an expert on barrels for muzzle-loading rifles. From 1938 to 1941, when he died, Addicks did a considerable amount of work on muzzle-loaders, and his observations on the best type of barrel for round ball seem to have been as sound as was his understanding of .22 caliber barrels.

Addicks decided that one turn of rifling in forty-two inches was best for .45 caliber barrels, and for barrels over .50 caliber, one turn in fifty-two inches was necessary. He preferred lands somewhat narrower than the grooves, and always cut his barrels with eight lands and grooves. However, in one case at least, he drilled and rifled two .53 caliber barrels with lands and grooves of equal width. Both of these barrels, which I own, proved very accurate and reliable.

One of these .53 caliber Addicks barrels weighs twenty-two pounds, the other ten pounds; both are forty-five inches in length, rifled with one turn in fifty-two inches. Bore diameter is .538 inch, and groove diameter .552. The twenty-two pound barrel is fitted with a percussion lock, while the ten-pound barrel is a flintlock. The complete weight of these rifles is twenty-six and one-half and thirteen and one-half pounds. After firing many tests and in actual matches, I have never been able to decide fully that either barrel is superior in accuracy to the other. However, after doing considerable firing with this thirteen-and-one-half-pound flintlock, the wisdom of using a heavy rifle for these large calibers is soon evident, for the recoil becomes unpleasant after a few dozen shots, whereas the twenty-six-and-one-half-pound percussion rifle may be fired a hundred or more times without discomfort.

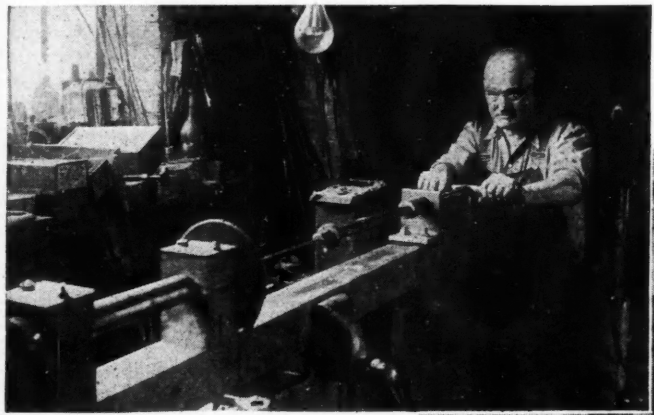
Flintlock rifles used these days follow the general description



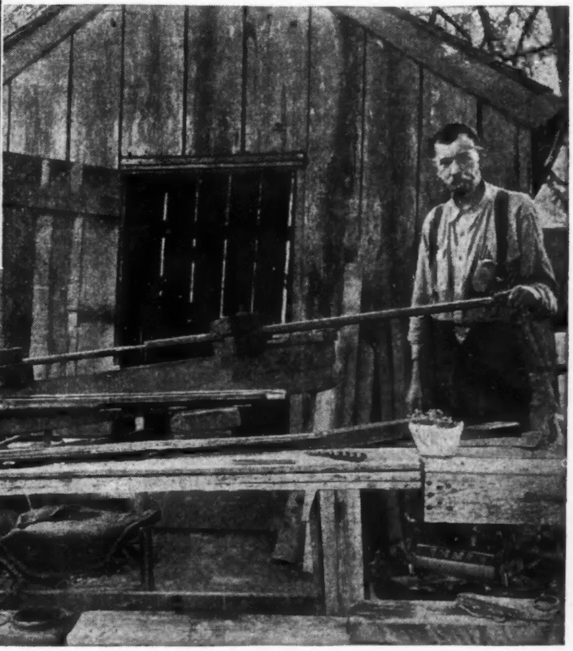
This "slug" rifle is representative of the fine target arms in use a century ago. Maker was Nelson Lewis of Troy, N. Y.

Another Lewis rifle. These arms were used with conical bullets and paper patch. Similar rifles were used by Civil War snipers of the percussion rifles, though few flintlocks are found with other than a full-length stock. They are most often fitted with open sights, and most flintlock matches are restricted to this type of sight. As far as accuracy is concerned, the flintlock rifle in steady hands is as dependable as a round-ball percussion rifle.

Heavy bench-rest "slug guns" are found in lesser numbers than round-ball rifles at the muzzle-loading rifle matches. There are several reasons for this. First, they never seemed to have been used in the old days on as large a scale as the round-ball type of rifle, and consequently not many of them have been available for those shooters who might have otherwise purchased and used them. Also, the great amount of time necessary for casting and swaging bullets, cutting patches of bond paper, weighing out powder charges, and then using the exacting care that is necessary in the loading and cleaning of these rifles is too much for many shooters, in contrast with the ease of managing their round-ball rifles. But there are many muzzle-gun enthusiasts who prefer the slug rifle to the round ball, and devote all of their interest to this weapon.



A modern gunsmith, who specializes in muzzle loaders, rifling a barrel. Grooved metal guide determines pitch of rifling.



Elmer Wolf, old-time gunmaker, rifling a barrel. An old barrel serves as a guide in cutting the grooves in the new bore

In weight, heavy "slug" rifles range from twenty to forty pounds, and fire long, cylindrical bullets of from .38 to .50 caliber, weighing 300 grains or so in .38 caliber to as much as 500 grains in the larger calibers. Powder charges range from sixty-five to 150 grains, depending on the caliber, of course. Patches are of oiled bond paper, either two or three strips, or sometimes cut in the shape of a cross by special dies that were made for the purpose. These rifles are equipped with false muzzles, which are removed before firing. These false muzzles are necessary for the proper loading of the long, flat-base bullets.

The method of fitting a false muzzle is interesting. Before the barrel is reamed and rifled, four holes are drilled, perhaps three inches deep, at regularly spaced intervals in the muzzle of the barrel. Then about two inches of the barrel is cut off on the lathe and both parts trued up. Into the cut-off piece four steel dowel pins are fitted snugly, to match the holes in the barrel. Then, the barrel and end section are firmly clamped together, and the reaming and rifling process completed. The barrel is then lapped to within several inches of the true muzzle, working from the breech with a lead cast, coated with a fine abrasive. This gives a choke at the muzzle of the bore which is considered quite necessary for the best accuracy. The end of the false muzzle is then slightly enlarged to permit free entry of the square-base bullet in its paper patch. The bullet is slightly larger than bore diameter, and it is necessary to use a bullet starter to force the bullet, with its patch, through the false muzzle and past the choke of the barrel. From there, it is easily seated with the loading rod.

The bullet seater is generally of brass, with a collar fitting snugly over the false muzzle. A plunger slides in the center of this collar, the end being shaped to the exact form of the bullet. The top of the plunger is threaded to receive a slightly rounded knob, to accommodate the palm of the hand in pushing the bullet, which requires quite a few pounds of pressure. This procedure is regarded as extremely important in that it must be done exactly the same with each loading. Otherwise, a difference in seating pressure might have a tendency to upset the bullet slightly and cause a loss of accuracy. *(Continued on page 42)*

THE DEVELOPMENT OF THE RIFL

PART I—1834 TO 187

By S. R. TRUESDELL

These articles grew out of a list of big-game hunters prepared as a spare-time diversion. The list was arranged chronologically where the details as to dates, countries, animals hunted, and the rifles used were available from the written accounts of the hunters themselves. No name was included unless the information was reasonably reliable and complete. The list, of course, included only a few of the men who have hunted big game in various parts of the world, but it did include all of the notable members of the clan, and many others not so well known. On this account, these articles are probably as representative of rifle preferences of the period and under the conditions then existing as it is possible to determine. Although the four parts of the study are divided under the titles large bore, medium bore, and small bore, this is entirely an arbitrary breakdown, and representative only of the majority of the rifles in use during those periods.

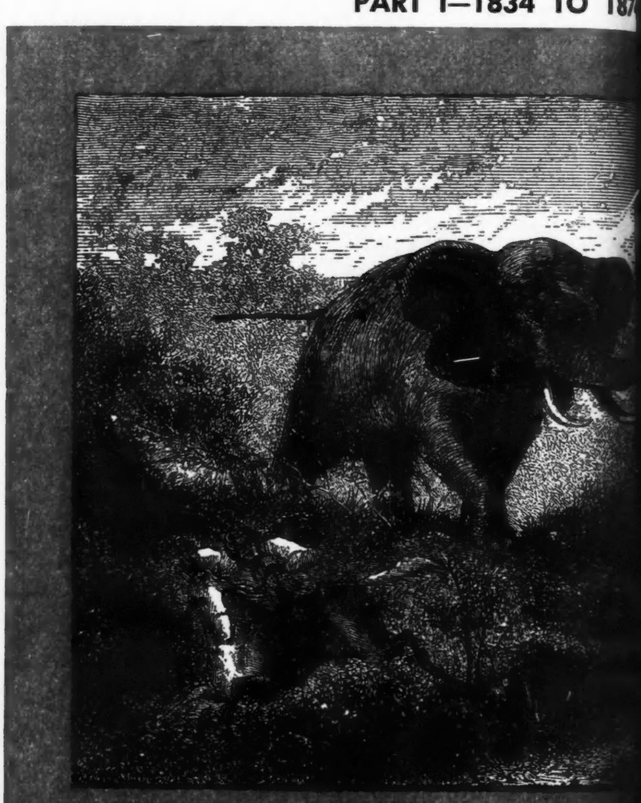
Except in North America, the hunting of big game has been possible for the common man only in the past 150 years. Firearms were too expensive, and the available big-game was owned by royalty or the landed gentry. With the development of travel and the colonization of backward continents, the explorer, the soldier, the planter, and the trader carried firearms for protection. Finding immense herds of wild game in many of these lands, until then safe except from the primitive weapons of the natives, these men turned to hunting for sport, to secure meat, or for the valuable hides, horns, or teeth.

Coincident with this opening of new game fields came the development of the rifle. In many cases this development centered around military weapons, but as frequently, it took the form of a more modern firearm adapted to the particular game hunted and made to the individual specifications of the purchaser by a gunmaker of his home country. These early rifles were handmade, of somewhat uncertain material, and at times of very crude workmanship. For hunting from horseback, or in the forest or jungle at short range, a muzzle-loading rifle had very little superiority over a well-made smoothbore. Considering that the rifle was a much more expensive firearm to make, its development as a hunting weapon is notable, and one for which the rifleman-hunter is principally responsible. The experiments of these men on big game of all kinds during the last century have resulted in the supremely accurate hunting rifle of today. In their hands, the unwieldy muzzle-loader with the round ball of uncertain accuracy and poor penetration yielded to the medium bore with conical bullet as the game became more wary and harder to kill, only in turn to give way to the high-velocity small bore of light weight when the hunter was forced to go still farther afield and afoot to find his quarry.

Contrary to popular belief, the modern sporting rifle did not evolve from the Kentucky rifle. The western plainsmen used large bores for buffalo hunting and for seventy-five years the Kentucky "pea" rifle was forgotten. When the small-bore, bolt-action, high-velocity rifle came into the hands of the big-game hunter, it was made in Europe. True, it had certain American antecedents such as the Lee magazine and the Berdan brass cartridge, but the bolt-action sporting rifle made no progress in this country until the Army picked a Danish small bore (the Krag), and later brought out the Springfield on a Mauser pattern. It was principally in India, Asia, and Africa that the modern sporting rifle grew up, and where its merit was tested on the largest and toughest big game of the world.

For elephant, the English in India and the Dutch in Africa, after 1800, used single-shot, muzzle-loading, four- and six-bore

S. R. TRUESDELL *is a Chicagoan, and special assistant to the president of the Chicago and Northwestern Railroad. He will be remembered by* Rifleman *old-timers as the author of "Bullet Design" in the November 1941 issue. After serial publication of the present study in* The Rifleman, *Truesdell expects to expand his material for release as a book.*



Elephant hunting in 1867. From a steel engraving in Bisset's 'Sport and War in Africa,' published in London in 1875

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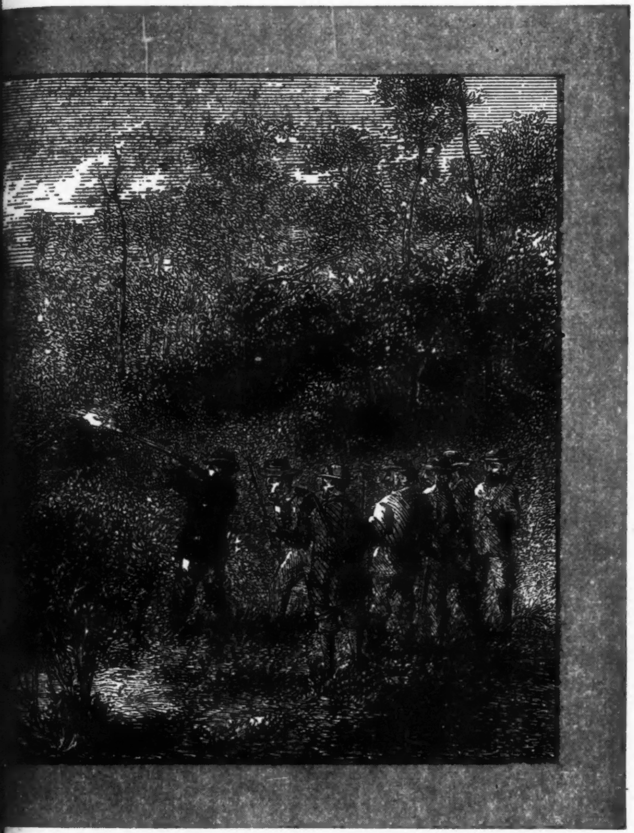
FL OR BIG GAME

O 187 THE LARGE BORES



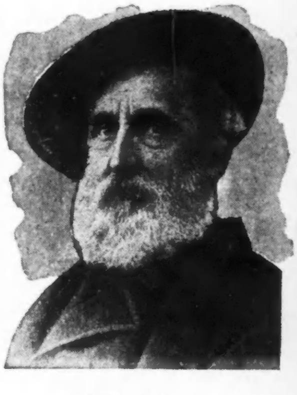
rifles, with two grooved thirty-inch barrels and a belted spherical ball. These enormous bore sizes represented the number of such balls to the pound of lead or, in the above instance, four-ounce and two-and-two-thirds ounce balls, respectively. Because of the fouling resulting from twelve to fifteen drams of black powder, the round ball was not always easy to load. A steel, brass, or rhino horn ramrod, carried loose on a thong, and a loading mallet were used to force the ball down on the powder. In a "poly-grooved" rifle the mallet was also used to upset the round ball into the rifling. If rammed too hard with a dirty bore, the rifle was very likely to burst. The rifles weighed twelve to twenty pounds, and required great skill and physique to load and fire from horseback. To secure lighter rifles and more fire-power, the English gunmakers supplied double eight-, ten-, and twelve-bore rifles, weighing eleven to fifteen pounds, with twenty-six to thirty-inch barrels.

This was the type of rifle used by Shakespear and Baker in India, by Harris, Oswell and Gordon-Cumming in Africa before 1860, for hunting elephant, rhino, tiger, lion, buffalo, and all other species of big game. Probably only the skill of the hunter, the speed of his mount, the shock of the heavy ball, and the dense cloud of smoke permitted him time to retire and reload. The penetration at low velocities was slight, and the hunting was characterized by the great number of shots usually necessary to kill an animal of large size. The following account of elephant shooting from Ronaleyn Gordon-Cumming in his *Five Years Hunting Adventures in Africa* (1843-1848) is typical. The parentheses are the writer's:

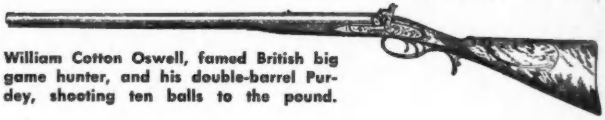
> "Having fired thirty-five rounds with my two-grooved rifle (a double twelve-bore Dickson which later burst from too much fouling), I opened fire upon him with the Dutch six-pounder (six balls to the pound), and when forty bullets had perforated his hide he began for the first time to evince signs of a dilapidated constitution."

In a later instance, Gordon-Cumming fired thirty-five balls from a double twelve-bore Westley Richards rifle at distances of fifteen to thirty-five yards to finish another elephant. As most loads were double charged with ten to fifteen drams of black powder, the recoil even with twelve to fifteen-pound rifles must have been terrific, and the accuracy questionable. Shakespear, hunting in India, however, does not bear this out in the following comment from his book, *Wild Sports of India* (1834-1859):

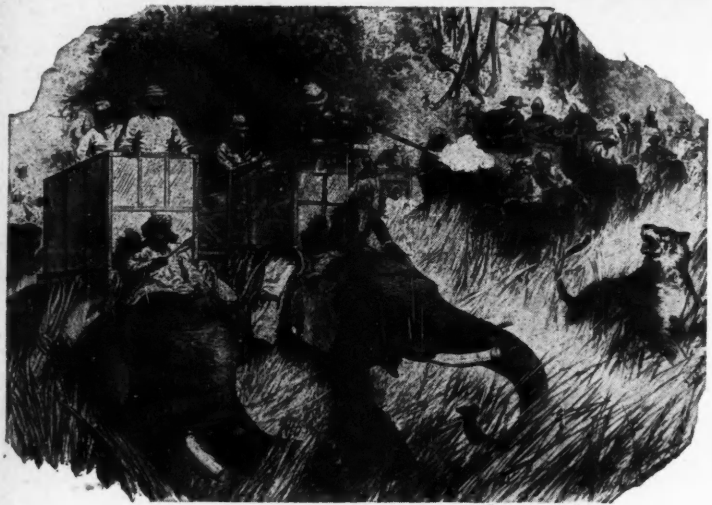
> "My own battery consists of two heavy double rifles and a double gun; the heaviest is a Westley Richards weighing twelve and a quarter pounds, length of barrel, twenty-six inches, poly-grooved, carrying bullets ten to the pound. It is a splendid weapon, bearing a large charge of powder without recoil; that is to say, its own bullet mould full of the strongest rifle powder. This weapon with its sights folded down carries point-blank ninety-five yards, and with great force. It has two folding sights; the first being raised, the rifle throws its ball 150 yards, the second 250. However, like all poly-grooved rifles that I have seen fired with large charges, the ball describes a parabola in its flight, rising gradually on first leaving the barrel for forty or fifty yards, and at that distance has risen some five inches; the ball then descends until it reaches the target at ninety-five yards.
>
> "My other rifle is a very broad-belted, two-grooved one by Wilkinson of Pall Mall. It takes a similar quantity of powder to the other and the bullet is the same weight. It does not throw its ball in the form of a parabola, but point-blank from the muzzle up to ninety yards. The folding sights are for 150, 250, and 400 yards. This rifle perhaps is the strongest shooting one



© Wm. Heinemann, London



William Cotton Oswell, famed British big game hunter, and his double-barrel Purdey, shooting ten balls to the pound.



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'The critical moment.' The Prince of Wales, tiger shooting with Sir Jung Bahadoor. From a woodcut of about 1870

> of the two. Its balls have gone through and killed a full-grown bear, while running at 120 yards; and on another occasion broke the backbone of a bear at eighty yards. The weight of the rifle is ten and one-half pounds, and the length of barrel thirty inches."

The ballistics in the above are somewhat peculiar. The reference to shooting "point-blank" does not mean, as some riflemen might think, that the rifle shot "flat" to ninety yards. The original bullseye was white or "*blanc*" and a rifle shot "point-blank" when its curve remained within the upper and lower limits of the bullseye up to a certain range. However, Shakespear's theory of one bullet describing a parabola and the other not cannot be explained by modern ballistics. The ten-bore rifle described shot a 700 grain round ball at 1,200 feet per second with eight drams of black powder, and would have a trajectory of five inches at fifty yards. In a twelve-pound rifle, the recoil would be about eighty foot-pounds, or five times that of a Springfield rifle, and certainly noticeable!

Between 1864 and 1877, Mr. George P. Sanderson was in charge of elephant catching for the Indian Government in Mysore. Although breech-loading rifles had just come into use, the preference was still for large bore. In his book *Thirteen Years Among the Wild Beasts of India,* he says:

> "I at first killed several elephants with a No. 12 spherical ball rifle, with hard bullets and six drams of powder, but I found it insufficient for many occasions. I then had a single-barreled, center-fire No. 4 bore rifle, weighing sixteen and one-half pounds, and firing ten drams, made to order by Lang and Sons, Cockspur Street. A cartridge of this single barrel, however, missed fire on one occasion, and nearly brought me to grief, so I gave it up and had a center-fire No. 4 smoothbore, weighing nineteen and one-half pounds, built by W. W. Greener. This I have used ever since. I ordinarily fire twelve drams of powder with it . . . Without something of the cannon kind, game of the ponderous class cannot be brought to fighting quarters with even a moderate degree of safety or effect . . . I am decidedly opposed to the use upon buffalo, bison, and such animals of the express rifle of either .500 or .450 bore (equivalent to 38 and 50 spherical gauge). The express is essentially a rifle for soft-bodied animals and is not adapted for use on those with thick hides and massive bones."

There is small wonder that big-game hunting in those days was an expensive and a strenuous sport. Rifles of the type described would cost $750 to $1,000, and cartridges in India about fifty cents apiece.

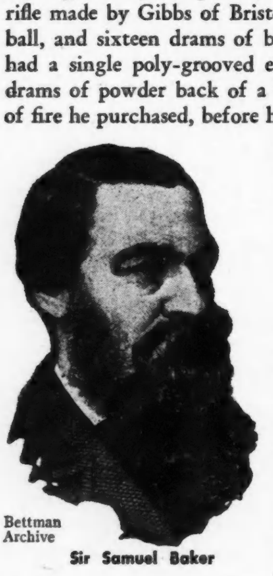
Sanderson was not the only one to revert from the rifle to a smoothbore. William Cotton Oswell, hunting elephants from horseback some years earlier in South Africa, started with a double twelve-bore rifle by Westley Richards and a single eight bore using belted two-ounce balls.

> "This last was a beast of a tool and once—I never gave it a second chance—nearly cost my life by stinging, without seriously wounding, a bull elephant. The infuriated brute charged me nine or ten times, and the number might have been doubled had I not at last got hold of the Purdey, when he fell to the first shot."

The Purdey was a smoothbore, double-barrel gun, shooting ten balls to the pound.

The accounts of the large bores are not complete without reference to Sir Samuel Baker's various rifles. His career from a young man of twenty-four in Ceylon, through various African trips between 1861 and 1873 and two round-the-world hunting tours, taking in North America, between 1879 and 1888, interspersed with numerous trips to Asia Minor and India, cover some forty-three years of hunting in a life of seventy-two years. With wealth sufficient to suit his whims, he had all of his rifles made to his personal specifications. His first, which he claims introduced the rifle to Ceylon in 1845, was a muzzle-loading, twenty-one pound, four-bore single barrel, two-grooved rifle made by Gibbs of Bristol. This used a four-ounce, belted ball, and sixteen drams of black powder. As a second rifle he had a single poly-grooved eight bore by Blisset, using sixteen drams of powder back of a two-ounce ball. For greater speed of fire he purchased, before he left Ceylon, four double ten-bore muzzle - loading, fifteen - pound rifles from Holland as a battery for elephant hunting.

In Africa Baker used the ten bores, but when the British Army adopted the Snider breechloader he had Holland make him a double .577 breechloader (648 grain conical bullet at 1,650 foot-seconds), which became his favorite rifle even on deer, bear, elk, and buffalo in North America. He did finally concede to the smaller bore, lighter rifles by purchasing a double .400 Holland Express for deer shooting in England and Scotland. But in *Wild Beasts and Their*



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Sir Samuel Baker

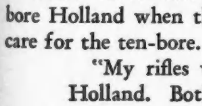
Ways, written in 1891, two years before his death, he insisted that for the largest game he would want a double eight-bore with fourteen drams of powder and three-ounce bullets! The Express hollow-pointed bullet of .400 to .500 bore he had no use for, and said he would not accompany any hunter if armed with such an inferior weapon in the pursuit of dangerous game.

Baker really closes the true large-bore period. Those who came after him passed out of the picture with the large bores, or changed to the smaller bores as they became better perfected. Of twenty-two hunters who were active during this "large-bore" period, ten used only large bores, seven more used medium bores in their later years, and five (Neumann, Rainsford, Mayer, Selous and Stockley) started with the large bores but lived to see and use the small bore. The Americans, Mayer and Rainsford, preferred medium and small bores even on large game, but Neumann and Selous, starting as ivory hunters, and Stockley, a specialist on tigers, came to the small bore by a process of elimination from the large bore.

Mayer, in his reminiscences, speaks of hunting in many lands, but never anything larger than the American buffalo, on which he used a .45-120 Sharps. His last rifle out of many was a .270 Winchester. William S. Rainsford, Rector of St. George's Episcopal Church of New York, made many North American big-game trips and two trips to Africa. On the largest dangerous game he used a double .450 English cordite rifle, but does not mention who made it. His favorite rifle on lion and antelope was a .350 Rigby Mauser weighing eight and one-half pounds and firing a 300 grain bullet at 2,150 foot-seconds. In addition, Rainsford had a .256 Mannlicher for the smaller antelope. Stockley used a .577 double rifle made by Westley Richards on tiger and bison in India. On elephant he used a double ten-bore. Stockley was killed by a buffalo in East Africa in 1910 but details are lacking. He may have used too small a rifle, ineffectively, because of his liking for the heavy rifles, as he had both a .303 Lee-Metford and a .256 Mannlicher with him at the time.

The two greatest exponents of rifle development from the large to the smaller bores were Neumann and Selous. Arthur Neumann was one of the world's greatest elephant hunters, hunting them over South East and Central Africa for thirty-eight years, from 1868 to 1906. He used two rifles interchangeably—a double .577 Gibbs and a military .303 Lee-Metford. In addition, Neumann later purchased a double ten-bore Holland when the .577 was out of order. But he didn't care for the ten-bore.

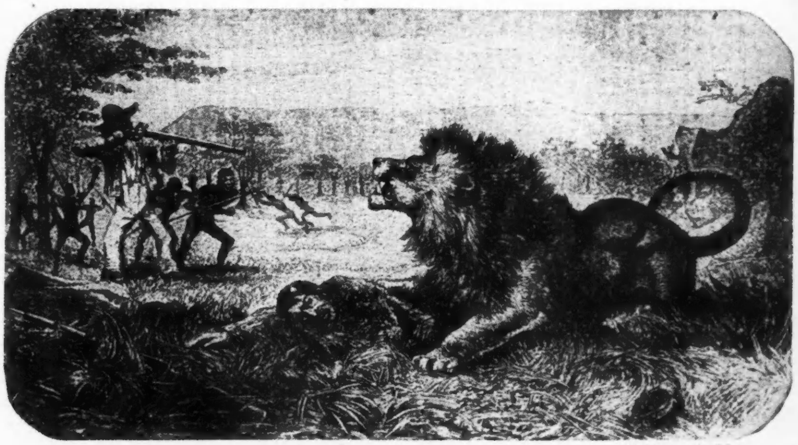
> "My rifles were now a Lee-Metford and a ten-bore Holland. Both had done their work well enough today; but I had not yet acquired thorough confidence in the former, and the discharge of the other was something of a shock, which though its rubber heelplate prevented from hurting the shoulder, made one's head ache and knocked one's fingers about cruelly. The volumes of smoke emitted, too, were appalling, and a source of danger, but its worst defect was that the breech invariably jammed and the empty cases stuck, so that they had to be knocked out with a stick. Altogether, I found my prejudice against big guns in no way removed, and regretted more than ever the accident to my trusty and equally effective .577."



Belted projectiles like these were favorites of early African hunters

Neumann had just killed five elephants with seven shots, using both rifles interchangeably. In 1896, his .303 missed fire and an enraged elephant caught him and crushed his ribs. He was three months recovering. Later he bought a double .450 Rigby which he liked immensely. As a second rifle, Neumann used a .256 Mannlicher, of which he had this to say in a letter to his friend, J. G. Millais:

> "With regard to the Mannlicher, I do think, beautiful weapon as it is, that it is rather in the extreme of small in the bore for general purposes in Africa. In spite of its high velocity, it has not *great penetrative power*, owing to the bullet being so light—there is really nothing of it. I have killed all the big beasts with it (bar elephants and, of course, it would kill them, too) but another time I think I should prefer a double .400."



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Gory incidents like this must have been frequent occurrences among big game hunters of the last century. Weapons were not efficient, and ranges had to be short. From a woodcut, 1858

Probably he underrated the penetration. Compared with the .450 Rigby, using a 480 grain bullet at 2,150 foot-seconds, the 160 grain bullet of the Mannlicher probably had as much penetration, but only half the shock.

The last and greatest of the large-bore graduates was Frederick Courtenay Selous. Ivory hunter, naturalist, explorer, settler, guide, and soldier, his hunting covered South East, Central, and North Africa, Europe, Asia Minor, Norway, and four trips to North America, between 1871 and 1913. He fought as a guide and scout in the Matabele and Boer Wars in South Africa and against the Germans in Tanganyika, where he was killed in action January 4, 1917. But Selous was not a military man. Perhaps if one designation fits him best, it is that of rifleman-hunter. In South Africa between 1871 and 1875, he killed seventy-eight elephants with a pair of Dutch "Roer" two-groove rifles, after his double twelve-bore Reilly rifle was stolen

(*Continued on page* 28)

"The Old Skratch"

By HOWARD CLARK

AL LINDEN, FIRST CITIZEN OF BRYANT, WISCONSIN, AND ONE OF AMERICA'S TOP GUNMAKERS, HAS MADE HIS LAST STOCK . . .

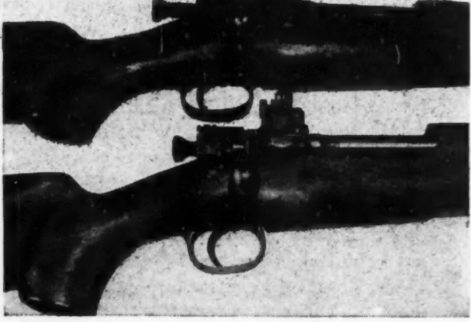
TODAY ONLY MEMORIES FILL the little farmyard shop where Alvin Linden of Bryant, Wisconsin, who came from Sweden as a boy and became one of America's greatest gunstock makers, fashioned his wonders of wood for so many years. Linden died early in the morning of July fourth at the Antigo, Wisconsin, Memorial Hospital. He was sixty years old.

All of Linden's gunstocks came into being in a tiny frame shop, about twenty by twenty-four feet in size, on the old Linden homestead, now the farm of his brother-in-law and sister, Mr. and Mrs. Donald J. Grant of Bryant, a little community located about nine miles northeast of Antigo. Bryant's population numbers only about 100—a few potato warehouses, a tavern or two, a grocery store, and a filling station—but Linden put the community on the map. Each year hundreds of persons, some traveling thousands of miles, came to visit him. A more gracious host never lived—let a stranger enter the door and Linden would lay aside all work in favor of the caller, the resulting "bull sessions" sometimes lasting far into the night.

"The Old Skratch" knew firearms from front sight to butt plate, but his knowledge didn't stop there. A tremendous reader, personally acquainted with persons in all walks of life, he could talk authoritatively on practically any subject. No conversation lagged in his presence. He was a bachelor and consequently most at home in a stag group. But women who accompanied their husbands into the shop soon found themselves hanging on every word Linden uttered, just as interested in the goings-on as the men, though Linden was strictly a "man's man."

Perhaps the most intimate of his friends were from his home state, particularly from the cities of Stevens Point and Green Bay. When these cronies came to visit, usually on a Sunday, anything could—and usually did—happen. Generally, the visitors brought dozens of bottles of beer, a big chunk of ice, and enough food for a small-sized army. Informality was always the order of the get-togethers, with Linden, bottle in hand, keeping things moving at a lively tempo. The shop never lacked firearms and ammunition, and no party was complete that didn't see a few shots fired over Linden's wood pile into a gravel pit some 270 yards distant, Linden observing each shot through a 20 power scope fitted to a homemade wooden tripod. The "old wood butcher" was no slouch as a marksman, and scores of persons marvelled as they watched him plaster bullet after bullet off a washpail-sized rock in the pit. The gatherings never broke up before early evening, and then only over Linden's strong protests.

Thousands of others, who never had an opportunity to meet Linden personally, knew him through letters that can only be regarded as literary masterpieces. Blunt, direct, sometimes profane, they reflected Linden's character like a mirror. No person who wrote Linden for a quotation on a stocking job or on any other subject had to guess what the old Swede meant—he never left a doubt in anyone's mind. Most of his letters, it's safe to assume, are now carefully tucked away by the addressees, to be reread time after time. "Linden's letters couldn't be read before Aunt Minnie's sewing circle," commented Stephen F. Colladay of



Along with his famed big-game rifles, Linden remodeled many .22s, like this fine squirrel rifle

☆ ☆

Owners of Linden's stocks claimed they could recognize his workmanship "as far as they could see it"

Jessup, Maryland, "but just corresponding with him has been wonderful. If he doesn't make a stock for me, I'll still have something to show." Linden had planned to start work on two restocking jobs for Colladay this fall.

Linden had many outstanding qualities, among them integrity. He hated, despised, all things phoney—persons, firearms, or anything else. He was lavish in his praise of the right, bitter in denunciation of the wrong. To give credit where it was due was another of his principles. Still another attribute was unselfishness, even in dealings with stockers who could only be regarded as competitors. Keith Stegall of Gunnison, Colorado, one of the nation's up-and-coming stockers, can vouch for that. A few years ago, when Stegall lived at Pampa, Texas, and had not yet acquired the fine reputation he has today, he wrote Linden for information on the shape of a cheekpiece. "The Old Skratch" not only replied in great detail to Stegall's query, but took an hour or so of sadly needed time, crated up a finished stock, and sent it to Stegall for examination.

Scores of stockers visited Linden's shop, popped questions at the wood butcher, watched him turn rough planks of walnut or maple into things of beauty, and asked for suggestions as to betterment of their own work. Those he knew to be square shooters couldn't have received better treatment—Linden answered all their questions, and criticized their work.

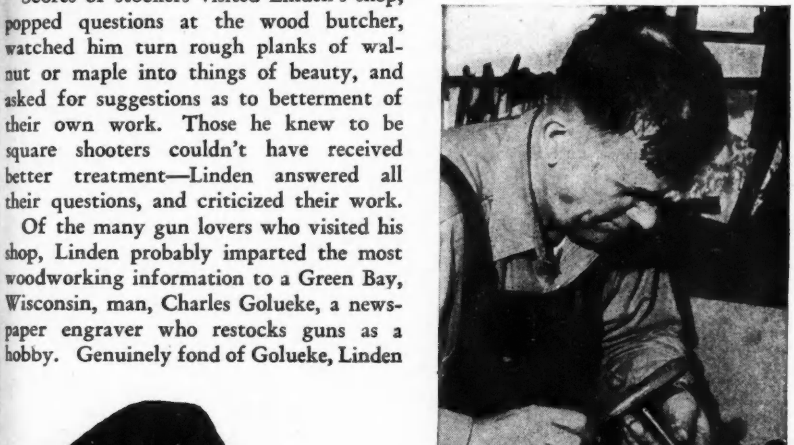
Of the many gun lovers who visited his shop, Linden probably imparted the most woodworking information to a Green Bay, Wisconsin, man, Charles Golueke, a newspaper engraver who restocks guns as a hobby. Genuinely fond of Golueke, Linden devoted hours to him and so skilled was Golueke, so rapid his development, that in his last year or so, Linden referred to him a number of jobs that he could not undertake for lack of time. Golueke's stocks are nearly perfect, marked by a strong Linden influence, and Linden had only high praise for the Green Bay man's work, "passing" all his stocks with a high grade after careful inspection. Most of the jobs Linden turned over to Golueke involved shotguns or other weapons with two-piece stocks, a type Linden didn't particularly enjoy making. The future of Golueke, Linden's only student, promises to be a bright one if he elects to continue his stocking activities.

Tucked away in the backwoods of Langlade County as he was, the greater part of Linden's contact with the outside world was by mail. As a result, he learned to write in a homespun style of his own. With a battered typewriter performing as skillfully for him as his chisels, Linden prepared a series of booklets on the various phases of firearm restocking and conversion. Three of these booklets have been published.* A fourth, nearly ready for the printers at the time of his death, will be completed by Golueke, Gunsmith Emil Koshollek of Stevens Point, and others of Linden's friends. For the most part the booklets are technical in nature, developing in detail the many steps in restocking and altering firearms, but they contain a lot of material of general nature and are good reading for a person who never shot a gun, let alone restocked or rebuilt one. The author's keen sense of humor is in evidence throughout the books; so is his broad, philosophical outlook. The little publications are filled with typical bits of Linden color. At one point he suggested that the fit between metal parts and wood should be close—"tight as the rear of a steer in fly time"—not a pretty expression, but an accurate one, readily understood by his readers.

Not until Linden's booklets were printed did most of his friends know he was talented in another line—art. Each of the booklets contained two huge sheets of full-sized drawings of guns that Linden had restocked, sketches so complete and accurate that amateur stockers could, with dividers or ruler, transfer dimensions directly from the drawings to stocks on which they were working.

Until a few years ago every one of Linden's stocks took shape through grueling efforts with hand tools. A few years ago he decided to install some power tools. First came a band saw, then a drill press. With these he eliminated a great part of the back-breaking, noncritical work that goes into the making of every gun stock. The niceties of restocking—shaping, finishing, and checkering—continued to be hour-consuming, hand operations.

Fine walnut was Linden's favorite restocking medium, with flint-hard maple from his own Langlade County a close second. But in the nearly thirty years of his career, he worked in prac-



Whether working with a coarse saw or laying out the finest of checkering, Linden's artistry and love of guns was evident in the way he handled tools

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* Firearms Design and Assembly, by Alvin Linden: 1. Inletting the Stock Blank; 2. The Shaping of Inletted Blanks; 3. Finishing of Gunstocks. Published by Samworth, Plantersville, South Carolina.

tically every hardwood suitable for stock use, including myrtle, zebra, mahogany, and cherry. He imported some stock blanks from England and France, though most, particularly in recent years, were obtained from dealers in this country. He also out many of his own blanks from flitches, or rough planks, purchased from dealers. Linden was fussy to the Nth degree in selecting wood for his stocks. Unless it was thoroughly dry, preferably kiln-dried, dense, laid out with proper grain direction through grip and forearm, and free of burl or other prominent figure in places where warpage could cause trouble, he would refuse to use the material. He loved beautiful, highly figured wood, but often cautioned against its use on firearms where accuracy was of importance, contending that a really good shooting rifle could have figure only in the butt, with straight grain, sloping slightly upward, through the grip and in the forearm.

Linden had hundreds of friends. On evenings when the "hot stove league" met in his disordered shop, the old Swede took the lead in discussions of everything from gunsmithing to religion

In direct contrast to his great fame as a stocker, his tiny shop was as unpretentious as his dress—which usually consisted of overalls, a tan suede cloth shirt, a cap of the type worn by railroad engineers, and wide, black, comfortable shoes. One almost needed a map to locate his shop, set on the edge of the woods that Linden loved so well, but that didn't keep friends in the gun world from coming hundreds, sometimes thousands, of miles to see him. Tools, gunstocks, blanks, oddities—mounted rattlesnake skins and alligator hides—lay everywhere in the crowded shop, and visitors wondered how anything could be located. But of the thousands of articles in the shop, none was lost—though it took old Al a few moments to locate some.

The great stocker was born in Motala, province of Ostergotland, Sweden, on June 28, 1886, the son of a skilled cabinet maker and expert boat builder. In the spring of 1892, Linden's father emigrated to the United States and in August, 1899, Mrs. Linden, Alvin, another brother and two sisters joined him at Pullman, Illinois, where Linden, senior, was working for the Pullman Company. The fall, winter, and spring of 1899-1900 saw Linden attending a Pullman school (he had graduated from public school in Sweden after completing a three-year course of manual training), and on July 5, 1900, he, his father, and others from Pullman went to Newark, Ohio, to build a new railroad shop. The group worked there until February, 1901, then returned to Pullman. In March, 1901, Linden was sworn to be fifteen years old, although he actually lacked a few months of being that age, and went to work in the Pullman shops.

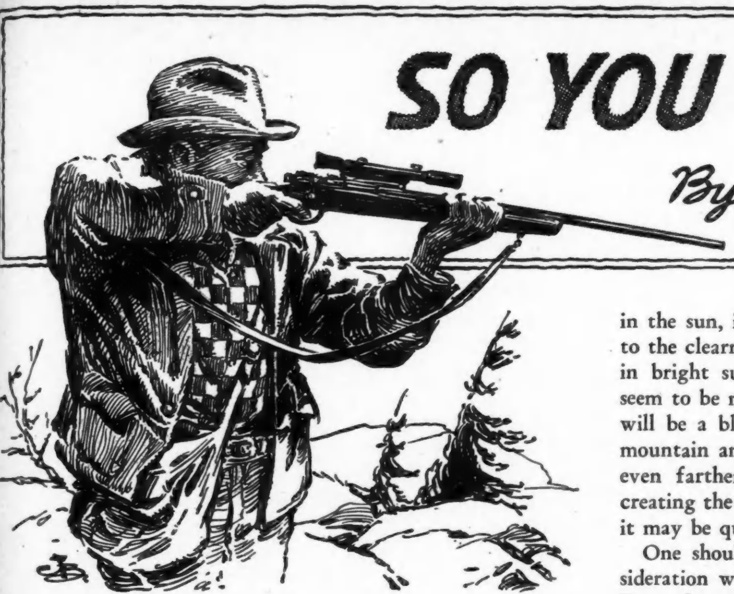
When Linden was twenty-one years old an accident occurred that was to make him a partial cripple for the rest of his life. He was working on one end of a cross-cut saw, cutting a timber, and backed into the broken stub of a limb, suffering an injury to the lower back. A tough woodsman, he paid little attention to the injury and continued to work, although experiencing considerable pain. A little later he become aware of stiffness in the back which grew progressively worse. Finally, he consulted a physician and was sent to a Madison, Wisconsin, hospital where X-rays disclosed two or three lower vertebrae had grown together. Physicians at the hospital advised Linden to "take things easy because a fall or slip might kill you." His troubles, though, weren't over. A rheumatic condition developed that further crippled him. He was so crippled that he experienced great difficulty in walking. It was then—about twenty-six years ago—that Linden began to make gunstocks.

He started out as a stock maker with little to use in the way of either patterns or tools, and Grant recalls that some of Linden's initial attempts were so unsuccessful that they ended up in the stove. Always critical of his own work, Linden liked to tell his friends that his first stock "was a sight." At the start he worked largely in cherry, then turned to maple, and finally to walnut, maple being too hard to work day in and day out. He experimented constantly with various finishes for his stocks and generally used the best varnish he could obtain, brushing on many thin coats and rubbing each down. Another of the master's tricks, of which he was proud, was use of the "suigi" finish to bring out contrasts in light-colored wood, such as maple and birch. This involved nothing more than scorching the surface of the stock lightly with the flame from a blowtorch!

The "old wood butcher," as he loved to call himself, lived a full life and, through craftsmanship that may never again be equalled, brought pleasure to hundreds of persons who were fortunate enough to acquire his stocks. The shaping of Linden's stocks was superb, the inletting and checkering flawless. Gun lovers claim that one of his works can be recognized almost as far as it can be seen. Always collectors' items, Linden's stocks will now be doubly precious to their owners. In recent years an occasional Linden-stocked gun was put up for sale; but those days are gone forever. ● ● ●

SO YOU MISSED!

By Bob Hagel



Across the canyon, perhaps 300 yards away, a small black bear was feeding. His coat shone in the clear light of the sinking sun. My side of the canyon was in shadow, and the bright, slanting rays made the bear stand out like a black silhouette on white paper.

I knew the canyon was wide at this point, but that bear looked too clear to be more than 300 yards away. I took up a prone position on a flat shelf atop a cliff, tightened the sling and squeezed the trigger. The big rifle cracked and my bear turned a somersault backwards and half ran and half rolled down the mountainside. As he reached the bottom of the canyon and started up a long slope, I could see his right front leg swinging from just below the brisket. I took a hasty shot as he crossed an open space some 600 yards away, but only helped to speed an already speedy departure.

I looked at the rifle and then at the spot where the bear had stood, and tried to figure out just what had made that shot go low. Not until I reached the bottom of the canyon did I realize that the range had been a good 400 yards instead of the 300 I had thought.

Before someone says that 400 yards is too far for accurate shooting anyway, let me say a few things to the contrary. I was using a scope-sighted, custom-built, .30 Newton. My ammunition was loaded with 172 grain open-point bullets and the chronographed muzzle velocity was 3,220 feet per second. I had the rifle sighted in to place its bullets exactly where I held at 300 yards, and I knew exactly where the cross hair was when the shot was fired—just above the knuckle of the foreleg—and that's where the shot would have gone if the range had been the supposed 300 yards. What I had failed to take into consideration was that the bear was in bright sunlight, and I was in deep shadow, which made the bear seem to be at least 100 yards nearer than he really was.

This is one of the causes of misses in mountain hunting, where much of the shooting is across some draw or canyon. However, this will work as well one way as the other. As in the case mentioned above, where the hunter is in shadow and the game in the sun, it will very often seem closer than it really is, due to the clearness of profile. On the other hand, if the hunter is in bright sunlight and the game in shadow, the range will seem to be much farther than it actually is. Often, too, there will be a blue haze at the point where the shadow from the mountain and the sunlight meet. This makes the animal look even farther away, because it appears less distinct, thereby creating the impression that it is a long way off, when in reality it may be quite close.

One should always take these lighting conditions into consideration when shooting across a canyon or against a hillside. Even if game is in heavy timber and, therefore, in shadow, and the sun is high in the sky, where it would not affect the scene, the animal may seem farther than it really is because of the camouflage created by the shadows of the foliage overhead.

If the range at which one finds he must shoot is, say, 400 yards, and under any of the above-mentioned conditions, I would suggest the addition or subtraction of from fifty to 100 yards in accordance with conditions.

There are other circumstances where light may play havoc with the best-aimed shot. In heavy fog the game invariably seems farther than it is, and in heavy snow or rain. In hunting fairly flat, heavily timbered country where it is possible to see a considerable distance along natural lanes, through the trees, the light is usually poor and an animal looks farther away than it would in the open, in bright light.

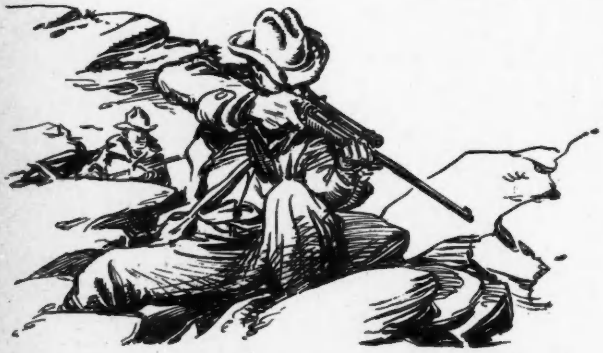
Under the latter conditions, if the animal appears to be far enough away to make it necessary to hold over his back to get a hit, it is very likely that you will overshoot entirely because you believe the game farther away than it actually is.

On the other hand, after the first snow has fallen in the fall and the sun is bright, game in the open will be silhouetted clearly and look very close. In such cases, it is natural for a hunter to undershoot an animal at long range.

A GUIDE AND PROFESSIONAL HUNTER CALLS A POST MORTEM ON SOME SHOTS THAT SHOULD HAVE CONNECTED . . . . BUT DIDN'T

My friend Elmer Keith once told me of repeatedly missing a huge old mule deer at what he thought was good range for the .405 Winchester he was using. After the buck finally ambled off, Elmer found all the bullets in a compact group in the snow, just back of where the buck's forefeet had been. Don't let anyone get it in his noggin that Keith can't put his bullets where he wants them. He is the best and deadliest game shot the writer has ever had the pleasure of hunting with. But there was a new fall of snow and a bright sun, which made that old buck stand out sharp and clear even at long range. Elmer had misjudged the distance 100 yards or so, and the drop of the old .405 had done the rest. It happens to the best of us.

Another place that most of us fall down badly in judging range and making our first shots count is in high country, above timber line, where a good deal of sheep and goat hunting is done. In fact, I believe there are more people totally at a loss to estimate the distance of an object at elevations above 9,000 feet than anywhere else. If the weather is fair, the thin, clear air makes visibility so good that one can see things that would fade into obscurity at lower levels. I have seen hunters want to shoot at a goat a half mile away on some rocky ridge, and on being told it was out of range swear that it was not over 300 yards. This leads to a lot of misses that looked like a cinch.



"The commonest cause of misses, under good lighting conditions, is overshooting when the shot is at a steep downhill angle. . . ."

There are a lot of other things that may cause misses, near misses, or cripples—(which are worse than a miss to the real hunter)—and that may be termed "optical illusions," though not matters of misjudging distance.

The commonest of these, under good lighting conditions, and with the game well within range, is that of overshooting when the shot is at a steep downhill angle. I have heard a good many reasons given for this. Some of them are a long way from right. Some inexperienced riflemen even claim that a bullet rises above the line of sight if the angle is steep. This is far from true, unless the rifle is sighted at, say, 300 yards, and the shot is at 150 yards. In that case the bullet would be several inches above the line of sight at the midrange of 150 yards, the exact amount depending on the velocity and the consequent trajectory. However, the rise above the line of sight would be the same on the level as on the downhill shot, unless the angle were very steep indeed. Of course, if the angle of the shot is over 45 degrees and from that to 90 degrees, the drop would become less, and it is obvious that the bullet would have no "trajectory" at all if fired straight down. However this may be, we can leave the trajectory out of the picture and assume that the game is at approximately the same range at which the rifle is zeroed. In that case the rifle will not shoot high, no matter how steep the angle.

The reason for so often shooting over an animal when firing downhill is a fault of the eye rather than of the rifle. When we are above an animal and look down at a very steep angle, we see not only the side of the animal clearly but also the whole back. This adds about a third more to the surface we see, and yet we think only of the side we are looking at. Therefore, we are inclined to hold about center, or what we *think* is the center, of the rib. In reality, we are holding along the near edge of the back. Even with this hold, it appears to the eye that there are several inches of hair over the sight, but the back is rounded and setting at a more-or-less flat angle to us. The fact is that there is very little actual surface over our line of sight, and part of that is hair. The outcome is that the bullet either passes entirely over the back or just grazes the backbone and knocks the animal flat. Chances are, it will then slide a few feet and get up and leave that place as if the devil were hot on its tail.

I find the best way of being sure of a hit under circumstances like these, if the game is well within the range your rifle is sighted for, is to hold very close to the *bottom* of the animal. Then you are fairly sure of a good hit.

A good many people also seem to think that a bullet will drop considerably more uphill than when fired on a horizontal line. This, also, is not true. If the shot were to be fired at an animal straight above the hunter there would be no trajectory for as far as your rifle would send its bullet. If a goat should suddenly appear on a ledge at a very steep angle above you, don't hold over him, thinking that your bullet will drop more than on the level.

Another problem is in shooting at game standing quartering to the hunter. How many of us have taken a shot at game that we thought was standing almost broadside, only to find on examination of the kill, that the bullet had passed through the animal quartering and hardly touched the vital area at which it was aimed? I have seen a good many deer go farther than the hunter thought they should because they were standing in a quartering position when the hunter thought they were broadside. This usually happens when the deer is slightly facing the hunter. Most hunters will hold just behind the front shoulder, so the bullet will pass through the lungs and rib cage, and thereby miss the shoulders and ruin a minimum of meat. This is a very good shot when the animal *is* broadside, but should he be a little quartering toward us, the bullet is very apt to pass through the animal without touching the lungs, only penetrating the paunch instead. And an animal so shot will very likely go a considerable distance before the hunter is able to finish the job.

Another position that is sometimes deceiving is when the game is standing facing the hunter in something of a "kink," with the body bent in a curve. A shot right in the "sticking place" will often come out behind a shoulder instead of going back into the lungs. I remember shooting a big buck that was standing apparently facing me. He had his head down, feeding, and was reaching to the side when I fired. At the shot, he whirled into the timber and out of sight. I was pretty certain he would not go far, as I was sure the bullet had penetrated the lungs. I took up the trail and followed that buck for nearly half a mile before I found him dead. The 180 grain soft-point bullet from my .30-40 had entered the body almost in the center of the chest and gone through between the shoulder blade and the ribs, making an exit behind the front shoulder. Fortunately, a small piece of jacket had slipped off through the ribs and penetrated a lung. If this had not happened, I would have never seen that deer again because the leg wasn't even broken. The bent position that deer had assumed in feeding, with his head bent uphill, had caused this, and it was only luck that I got the deer.

Another point where many misses and cripples are chalked up to the discredit of the hunter is when shooting in heavy timber and brush. If the game is on the run, as is usually the case, there is a fifty-fifty chance that the bullet will contact some tree or twig before it reaches the animal. The hunter, following the moving animal with his rifle, attempts to shoot between the larger trees, and very often never sees the smaller branches or brush.

Even if the game is standing, there is a chance that the bullet may strike a branch or twig that was not seen by the shooter. In this event, the bullet will open up on the branch, and either miss the game entirely or hit it in several pieces and give very poor penetration. If the game is large—elk or moose—chances are that the pieces of lead and jacket will make several shallow wounds but will not have penetration enough to reach any vital organs and thereby give a clean kill.

Except for very short ranges, the best remedy for this is a good hunting scope of not more than three power. This will show up small twigs and branches that would go unnoticed with iron sights.

This is especially true if the shot is at standing game. Many times I have raised my rifle to fire at game in brush, only to lower it again and try to maneuver into better position, because there was some twig in line with the vital spot at which I would have to aim to make a clean kill. This would have been unseen with the naked eye, but stands out clearly through the scope. For short-range shooting in thick brush, the scope is a disadvantage. It will blur out twigs that are close to the shooter.

A rifle firing a heavy bullet at not too high velocity is best suited for hunting in heavily timbered country. The bullet should weigh at least 220 grains, be of not less than .30 caliber, and not be fired at over 2,500 foot-seconds. With bullets of this weight, the chances for a kill, even though a limb or tree is hit, are much better. That heavy bullet, traveling at low velocity, is not apt to disintegrate on contact with small brush. While it may mushroom, it will usually go on and hit somewhere near the point of aim, and still retain enough of its original weight to give good penetration.

Of course, we all know that a good many more misses are due to poor marksmanship than anything else. This is true, of course, of the average hunter who is only a fair shot. If the hunter is really a fine rifleman, he knows where his bullet will land when the rifle is fired, and he can tell you if the bullet went high, low, to right or left, or to the exact spot at which he aimed. In rifleman's language, he can call his shot before he sees it. With hunters who can shoot in this style, a miss is either *known* as a miss when it is fired, or there is something wrong other than the aim. This does not apply to running shooting as a whole, because too many other things enter into this picture.

Another thing to remember is: When borrowing a rifle, always try it out before you shoot at game. Even though the other man may be a very fine rifleman himself, that does not mean that the rifle he sighted in will shoot in the same place for you. If you have two cartridges for a rifle you have never tried, fire one at a target and find out where it hits. If it is off center, you will at least know how much and where, and have a better chance of connecting with that other cartridge when you see game.

"Buck fever," or puffing from a long climb, will often cause a miss, but this cannot be helped unless the game has not seen the hunter and there is time to quiet down.

A good rifle may change impact and give a miss through such faults as the stock taking up moisture and putting too much pressure on one spot along the barrel, or from loose guard screws. It is always a good plan to check the point of impact of your rifle before you go hunting if you haven't shot it for some time. This may avert a lot of hard work and disappointment.

Regardless of what the cause may be, all misses aren't caused by poor marksmanship. If we look around a little before we shoot, we will find that we will make a lot more clean kills, have fewer misses, and leave fewer cripples to die slow, lingering deaths.

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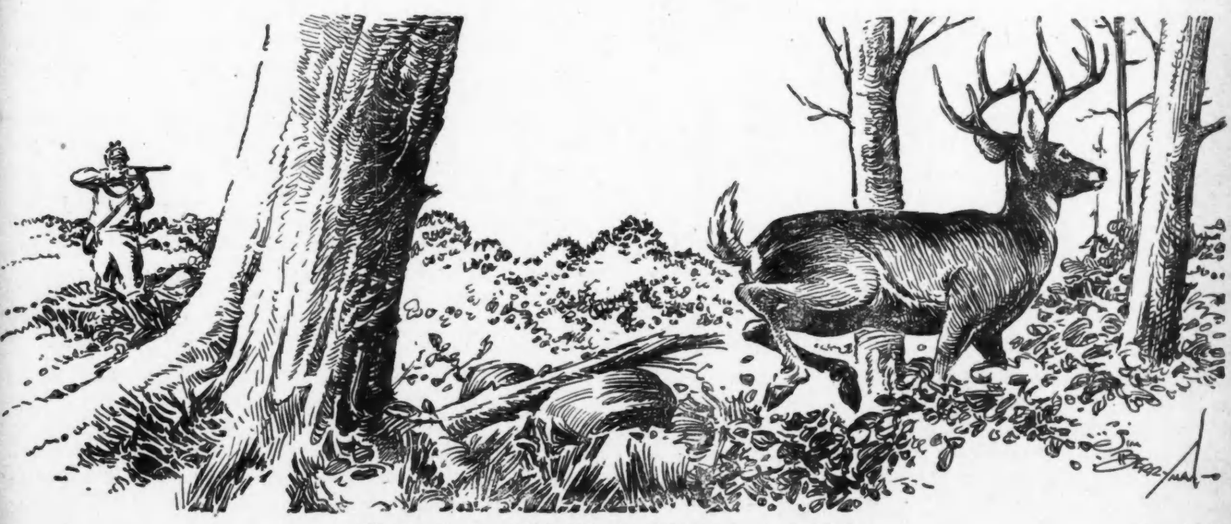


"At the shot, he whirled into the timber and out of sight."

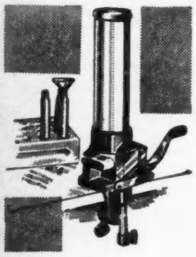
CONCLUSION

Introduction to HANDLOADING

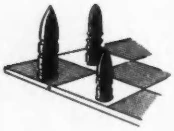
By AL BARR

AFTER DISCUSSING NEARLY EVERY ITEM which enters into the production of a finished hand load, we have one major piece of equipment to think about—the reloading tool itself. How can we select the tool best adapted to our own particular brand of reloading?

For the beginner at least, no single item of reloading equipment is more difficult to decide on than the reloading tool. There are so many tools to choose from and they vary so much in design that selection presents a knotty problem, even to the experienced handloader. Actually, for many years, thousands of accurate reloads were made with a very inexpensive tool which is now considered practically obsolete. This is the famous "nut cracker" type, which, though slow, is perfectly adequate for the home loader who does not intend to put his handloading on a production basis. However, the trend these days is toward the so-called "straight line" tool, with which all loading is done with the cartridge case being carried to the various dies in an obsolutely straight line. With this type of tool, even the inexperienced reloader can produce satisfactory handloads.



The main difference between tools is that some will full-length resize fired cases while others will size the case neck only. Obviously, a heavier and much stronger tool is necessary for full-length sizing. That, plus more costly sizing dies, makes the main difference, and accounts for the considerable variance in selling price between tools of these two classes. Another variation which runs into money is a tool which may be set up to load for two or more different cartridges without any change of dies or in the adjustments.



The main considerations in selecting a reloading tool for the beginner are: (1) Whether low- or high-velocity loads are to be used; (2) How often cases are to be reloaded; (3) Whether the finished ammunition is to be used in more than one rifle of the same caliber; (4) How many different calibers are to be loaded for; and (5) How many cartridges are to be loaded per week or month.

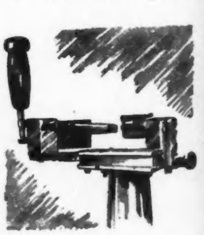
Low-velocity or midrange loads do not develop high enough pressures to cause troublesome case expansion and do not require full-length resizing of the cases after each firing. Manufacturing tolerances are such that new cartridge cases are a few thousandths of an inch smaller than chamber dimensions. When fired for the first time, they expand to a perfect fit, but the necks also expand to what would be a loose fit around the bullet and must be resized before loading. Other than this, no sizing at all is necessary for the lower-velocity loads.

High-velocity loads are another story. After a few loadings, cartridge cases expand sufficiently that they are apt to stick in the chamber and only resizing the full length of the case, or buying expensive new cases, will solve the problem. A word of caution at this point: Size cartridge cases as little as possible, as excessive working tends to make them brittle.

Many times cartridge cases fired in one gun will not fit the chamber of another of the same caliber and, for club use or when reloads are to be used in different guns, a tool that will full-length size is a necessity.

In addition to this matter of sizing cartridge cases, the reloader should consider the method of support for anchoring the tool. There are two general types. Possibly the better from this standpoint is the type in which the operating handle is moved in a downward vertical motion to complete the sizing and bullet seating operation, since a less sturdy bench is needed for this type of tool. Many good tools, however, operate in just the opposite manner, while lifting the operating handle. This is by no means a disadvantage except that a sturdier bench, anchored to the floor, is required.

Among the less expensive tools is the popular and well-known Ideal "nut cracker," which operates very much like a pair of pliers. Another, which is equipped for neck sizing only, but which may be clamped in a horizontal or vertical position for convenient operation, is the familiar Belding and Mull. In the same class, as far as operations go, are the Red Head, Meepos, Bond, Potter, Yankee, Lyman and Jordan. The latter is an exception in that it will full-length size the fired rifle cases. The Schmitt Horizontal also differs as all operations are performed with an easy horizontal movement of the operating lever, either for neck or full-length sizing. Among the most popular tools are those which must be anchored rigidly to a strong, solid workbench. In this class are the Pacific, the relatively new Hollywood Universal, and the Big Giant.



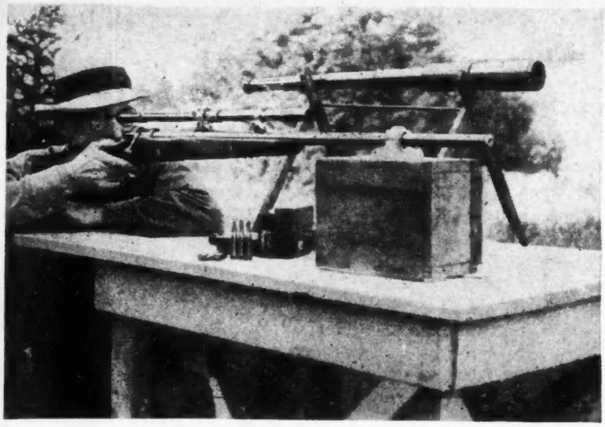
It would be next to impossible to list all of the reloading tools that are or have been on the market and that will produce good handloads. The point to be made clear, is not that one tool is necessarily better than another but that certain tools are better adapted than others to meet certain requirements. An example would be a reloader who wants a tool which can readily be converted from one caliber, either rifle or pistol, to another. What is needed in this case is a tool with dies having secure locking rings, thus permitting removal or replace-

(Continued on page 25)

ORIGIN of the .257

By N. H. ROBERTS

HOW ARE NEW CARTRIDGES DESIGNED? HERE IS A BEHIND-THE-SCENES STORY BY THE ORIGINATOR OF ONE OF OUR FINEST MODERN CARTRIDGES



The author, testing one of his .25 caliber Roberts-Mauser rifles from bench rest. Rifle has Niedner barrel, 11-inch rifling pitch

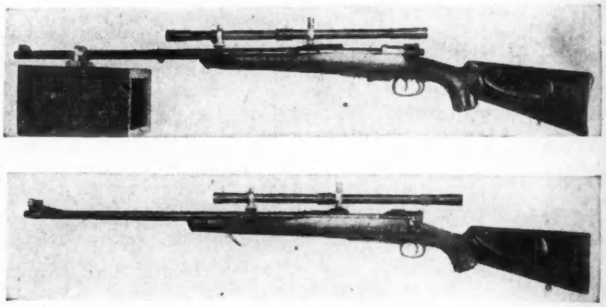
THE DEVELOPMENT OF A NEW CARTRIDGE does not come as a single flash of inspiration. Any qualified experimenter will agree that months, sometimes years, must go into the development of a fine "wildcat," and if that cartridge eventually is accepted by an arms company for commercial production, even more effort will have been spent in bringing it to its final form. The story behind the modern .257 Roberts, which was designed by me, is a case in point, and should be of interest to many riflemen. The development of a satisfactory .25 caliber high-velocity cartridge started almost a half century ago, with Dr. F. W. Mann, and the story was not brought to its conclusion until more than thirty years of experimenting had culminated in the adoption by our loading companies of the cartridge known today as the .257 Roberts.

The .25 caliber Roberts, the .25 Niedner, and the .257 Roberts are frequently confused by riflemen. These are three distinct cartridges, entirely different from one another.

The .25 caliber Niedner cartridge was designed by A. O. Niedner about 1913. It was made by necking the .30-'06 Springfield case to .25 caliber, and loaded with the .25 caliber commercial bullets then on the market or the 103 grain S.P. bullets that Niedner made by cutting and reshaping 117 grain S.P. bullets. In making these .25 caliber cases, Niedner left the .30-'06 case full length, and necked it down to .25 caliber, with the same length neck and same slope of breeching shoulder as in the original .30-'06 cartridge. That was, and still is, an excellent .25 caliber high-velocity cartridge. But when Niedner designed it, it failed to give as fine accuracy as desired because the case had too large a powder capacity for the regular-burning high-pressure smokeless powders then in use. With those regular-burning smokeless powders, even when used in maximum charges, excessive air space in the .25 Niedner cartridge decreased the accuracy.

In December, 1910, Niedner rechambered my Stevens Ideal 44½, .25-25 caliber rifle, which had a twelve-inch pitch of rifling, for the .25 caliber Krag cartridge, to be loaded with the .25 caliber commercial bullets we had then. The .25 Krag cartridge was made by necking down the .30-40 Krag case to .25 caliber, leaving the original case full length. Some years before this Dr. F. W. Mann had experimented with a .25 caliber Krag cartridge to be used with the Mann base-band bullets but Niedner told me that my .25 caliber Krag was the first he made to use commercial .25 caliber bullets.

In 1927, after F. J. Sage and I had devoted the greater part of our leisure for seventeen years to experimenting and thoroughly testing the .25 Krag in single-shot rifles, the .250-3000 Savage and the .25 Niedner in bolt-action rifles, we proved conclusively that the .250-3000 cartridge had too small a powder capacity and the .25 Niedner much too large a capacity for the high-pressure smokeless powders we had then. The .25 Krag was the nearest correct powder capacity .25 caliber H.P. cartridge, but in some respects was not quite right for the finest accuracy. We wanted a .25 caliber high-velocity cartridge which could be depended upon to make ten-shot groups of one inch at 100 yards rest with telescope sight, two-inch groups at 200, and three-inch groups at 300 yards. Our extensive tests proved that these three cartridges would not make such groups when used in the best custom-made barrels obtainable.



Above: This is the first of the author's .25 Roberts rifles, and was built for him by Adolph Niedner. Below: The first .257 made by Griffin and Howe, which was used to test the first lot of .257 ammunition made by Remington, before the cartridge was marketed

Therefore, after carefully measuring the powder capacities of many other cartridges, we decided that the 7 mm. case, necked down to .25 caliber, with a neck about three-eighths inch long and a breeching shoulder of the same slope as the 7 mm., would give us a .25 caliber cartridge of the correct powder capacity. When used in custom-made barrels, this would give us the desired high velocity accuracy at 100, 200, and 300 yards, or possibly at even longer ranges. I made sketches and drawings of the proposed .25 caliber cartridge. Early in September, 1927, we sent these to the Niedner Rifle Corporation and asked if they would make chambering reamers for this cartridge and furnish us barrels chambered for it.

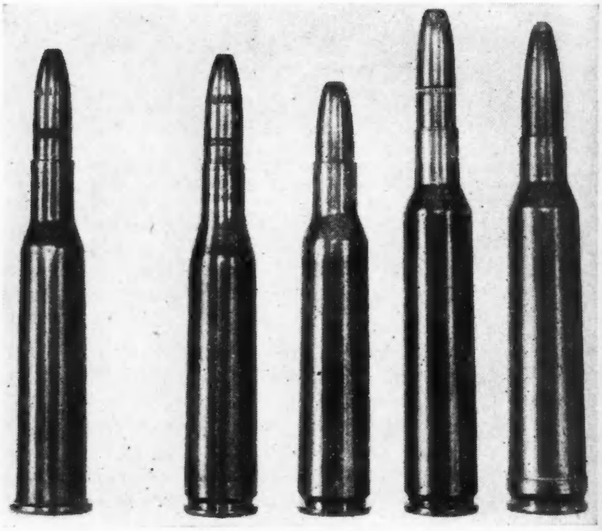
A. O. Niedner then sent F. J. Sage and me sample cases he had made by necking the 7 mm. case down to .25 caliber, about the shape suggested in the sketches we had sent him. He said they would make chambering reamers and tool up for this cartridge if we would pay one-half the estimated cost of $150 for the chambering reamers and other tools. Since Sage and I could not afford to pay $75 in addition to the cost of the new barrels fitted to our actions ($30 or more), we interested Colonel Townsend Whelen and two other riflemen in having Niedner build rifles for them which would take this new .25 caliber cartridge, each paying $15 on the cost of the reamers and tools. Then after Sage, Colonel Whelen, myself, and the two other riflemen had placed orders for rifles for this new .25 caliber cartridge with the Niedner Rifle Corporation, Mr. Stolley decided that they would make the chambering reamers and tool up for the cartridge without cost to us, furnishing barrels for this cartridge at their regular price.

However, before Niedner made the chambering reamers for this cartridge, a conference was held with Colonel Whelen, Captain G. L. Wotkyns, then located at Frankford Arsenal, and Niedner, in which Captain Wotkyns advised changing the slope of the breeching shoulder from Niedner's proposed angle of about 22 degrees to 12 degrees to reduce the pressures developed by at least 3,000 pounds. Niedner favored the sharper shoulder as it would be easier to properly head-space the rifles than with the more sloping breeching shoulder, but since the more sloping shoulder would reduce the pressures he accepted this change in the shape of the new case and made the chambering reamers accordingly. At this conference, Colonel Whelen insisted that the new cartridge be called the ".25 caliber Roberts" in my honor.

F. J. Sage and I received the first two rifles chambered for the new .25 Roberts cartridge that the Niedner Rifle Corporation made, early in 1928. Our tests fully convinced us that at last we had the practically perfect .25 caliber high-velocity cartridge for which we had worked so long. The first barrels we had for the .25 Roberts cartridge were cut with twelve-inch pitch of rifling and averaged one-and-one-quarter to one-and-one-half-inch ten-shot groups at 100 yards bench rest, telescope sight. At 200 yards rest the ten-shot groups averaged three to three and one-half inches. We then tested the cartridge in barrels that were cut with eleven-, thirteen-, and fourteen-inch pitch. Our friends R. C. Hussey, J. E. Morrell and G. E. Newbegin made extensive tests with .25 caliber Roberts rifles having ten-inch rifling pitch. These tests were made over a period of about four years. Results showed that barrels having a ten-inch rifling gave the best accuracy when the .25 Roberts cartridge was loaded with the three different weights of .25 caliber bullets we then had—the 87, 100, and 117 grain bullets. But if one desired to use only the 87 and 100 grain bullets, the best accuracy would be secured with barrels having twelve-, thirteen-, or fourteen-inch pitch of rifling. However, these slower twists of rifling would not keep the 117 grain bullets from tipping, even at 200 yards. With the twelve-inch pitch of rifling and maximum loads the 117 grain bullets tipped slightly at all ranges, but not enough to affect the accuracy.

In hand-swaging the 7 mm. Mauser cases to .25 Roberts, the necks were reamed inside while in the forming die. Thus, all these cases had uniform neck thickness of metal, which factory-made cases did not have, and is one of the advantages of the *.25 Roberts* cartridge, as well as one reason why it gave so much finer accuracy than our other .25 caliber cartridges.

The .25 Roberts cartridge soon became popular with varmint shooters, which induced Griffin & Howe, Inc., to furnish custom-made rifles of this caliber, usually having Niedner barrels. After a few years, the demand for these rifles increased and Seymour R. Griffin, the president of the corporation, suggested that the Remington Arms Company put this cartridge in production. Since the Remington Arms Company had, very kindly, made for me extensive chronograph tests of the .25 Roberts cartridge with many different loads and bullets, they had all the data on this matter and knew the merits of the cartridge. After much correspondence between Major W. E. Witsil, then the ballistic engineer at the Remington plant, myself, and Mr. Griffin, they decided to adopt the cartridge after changing the slope of the breeching shoulder to 21 degrees from the original 12-degree angle. It was put into production, under the name of the .25 Roberts, in May, 1934.



Here are some of the cartridges which figure in .257 Roberts history: (left to right) .25 Krag-Niedner with 100 grain bullet; .25 Roberts with same bullet; .257 Roberts with 100 grain bullet; .25 Niedner (.30-'06 necked) with 117 grain bullet; and .250 Magnum (.275 Holland and Holland cartridge necked) with 120 grain bullet

Before the next lot of these cartridges was manufactured, they decided—at the suggestion of Captain E. C. Crossman—.257 Roberts, and the Western .257 Roberts cartridges.

The great majority of riflemen today know nothing about the original .25 caliber Roberts cartridge. The .257 Roberts cartridge cannot be used in rifles chambered for the *original* .25 Roberts, but the .25 caliber Roberts can be used in rifles chambered for the .257 Remington-Roberts, the Winchester .257 Roberts, and the Western .257 Roberts cartridges.

The .25 caliber Niedner cartridge, .30-'06 necked, was also adopted by Griffin & Howe, Inc., who furnished rifles chambered for it but called the cartridge the ".25 Whelen." I notice that several rifle makers are bringing out this cartridge lately as "something new." A. O. Niedner designed it, and in 1913 and later, rebarreled Springfield Model 1903 bolt-action rifles for it. With the improved progressive-burning smokeless powders now on the market, especially the du Pont I.M.R. No. 4350, the .25 caliber Niedner is a superaccurate high-velocity rifle at ranges up to 600 yards or more. It is the largest-capacity .25 caliber cartridge practical. The .250 Magnum cartridges made by necking down the .275 H. & H. Magnum or similar cases, hold too much powder, heat the barrel too much in shooting, and cause rapid erosion, which ruins the best barrels in about 500 to 800 shots.

I find the .25 caliber Niedner cartridge loaded with 48 grains weight of du Pont I.M.R. No. 4350 powder and the 117 grain bullet gives an estimated velocity of about 2,900 foot-seconds or more, with very fine accuracy at all ranges up to 600 yards, which is the longest range at which I have tested it. This cartridge with a good, well-shaped 125 grain S.P. bullet and the correct charge of No. 4350 powder will prove a very fine, superaccurate, killer of deer, antelope, and similar big game at long ranges. It will replace the good .256 Newton cartridge and rifle that was on the market some years ago, being more accurate than the .256 Newton. The .257 Roberts cartridge loaded with 46 grains weight of I.M.R. No. 4350 powder and the 117 grain bullet gives an estimated velocity of practically 3,000 foot-seconds and very fine accuracy up to 600 yards or more. The same cartridge loaded with 45 grains of No. 4350 powder and the 125 grain S.P. bullet gives fine accuracy at all ranges with a muzzle velocity that must be close to 2,900 foot-seconds. In fact, I believe the Western Cartridge Company chronographed this load and bullet, finding it had 2,830 foot-seconds instrumental velocity at fifty-three feet. This will make the .257 Roberts particularly good on deer, antelope, and goats at long ranges when we get good 125 grain soft-point bullets on the market.

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Introduction to Handloading

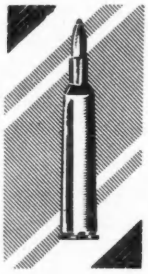
(*Continued from page* 22)

ment of the dies without altering of adjustments. Careful study of the manufacturers' literature will help the reloader select his first tool, if he has decided what he wants the tool to do. For reloading handgun cartridges alone, there are two outstanding tools. While they are relatively expensive, they are really production-line affairs, capable of turning out an enormous number of reloads with a minimum of labor. These are the Star and the Buchanan, now called the Pesco, I believe. These fine tools reload a complete cartridge in a single operation and mass production can be achieved at a rate of one to two thousand rounds per hour.

Fine Points of Reloading

One of the most easily overlooked items among reloading headaches is the fact that cases frequently become too long for the chamber. After firing several times, the brass will be found to have "flowed" forward to the case neck, thus increasing the over-all length of the cartridge case. This will not only cause inaccuracy but will give rise to excessive pressure when near-maximum loads are used. Fired cases should be checked for over-all length against an unfired cartridge and the necks trimmed accordingly. Special trimmers are available or, in a pinch, case length can be controlled by careful hand filing. Particularly troublesome examples of this are the .220 Swift and similar high-velocity cartridges having sloping shoulders and body angles. With cases of this type, the brass flows forward to a pronounced degree because of the pressures generated in these "high-intensity" cartridges and close neck tolerances must be maintained when using high-pressure loads.

Another frequently overlooked proposition when using heavy loads is that of outside temperatures. A load developed for cold weather shooting may prove to give considerably increased pressures during hot-weather months. This performance was demonstrated recently with some loads for an improved .220 Swift which were developed during the winter months. They were quite accurate in cold weather but when the same loads were fired during the summer months, excessive pressure was noticed. As an experiment, some of these loads were placed on ice for about a half hour and the results were amazing. From a good rifle holding a normal zero, the point of impact was fully one and one-half minutes lower with the refrigerated loads than with identical loads at air temperature. Proof of excessive pressures in those loads was shown in the form of punctured primers with the cartridges fired at air temperature. Accuracy was not materially affected. Caution should be used in summer shooting with loads which were developed in cold weather.



Another problem comes up when using Government .30-'06 cases with crimped primers. Special reamers are available for removing the crimp before insertion of the new primer, or an ordinary knife may be used if a tool is not available. All that is necessary is to trim out the slight flange produced by the crimping, so that the primer pocket will accept a new primer without deformation. That business of seating primers, incidentally, is important. Primers must be seated to their full depth in the pocket to avoid variations in ignition which can cause extremely erratic results. Similarly, primers should never be seated with such pressure that they are deformed, and a primer which starts in off-center, should be removed and a new one inserted properly. Any distortion of primers means a possibility of ignition trouble and consequent inaccuracy.

Once he has selected his equipment, the beginning reloader will do well to study recommended loads for the caliber he proposes to use and select a midrange, low-velocity load using a lead alloy or inexpensive jacketed bullet for his first trials. Skill will come with experience, and high-velocity loads should not be attempted until that skill has been developed. The reloader should always keep in mind the fact that a carelessly assembled cartridge can wreck a rifle—and perhaps himself. Handled carefully, reloading is an enjoyable, profitable phase of this shooting game, but like any other, it can be disastrous if carelessness creeps in.

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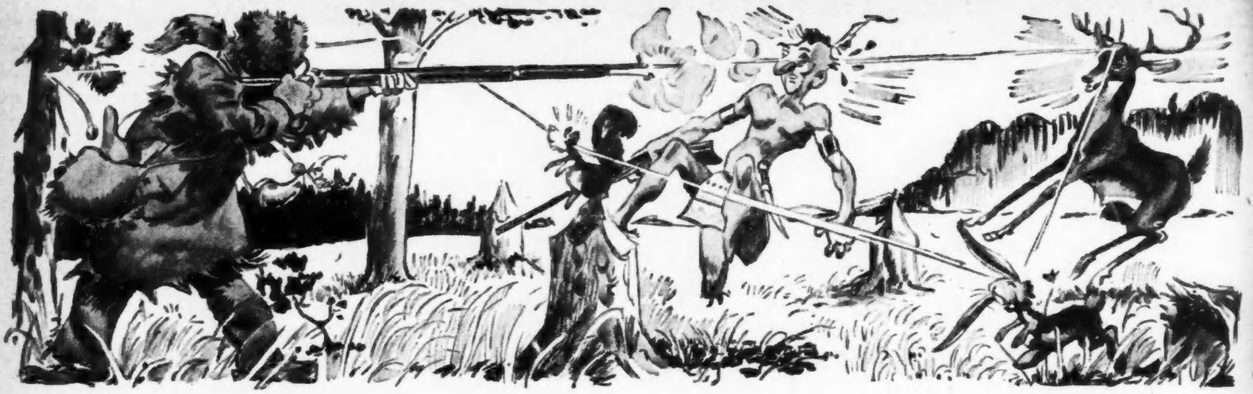


PRECOCIOUS PELLETS

By ALLYN H. TEDMON

THERE IS NO DANG JUSTICE in this country. Hardly was the ink dry on that "Mystery Lead" story of mine when, Zowie! The best I could tell was as nothing to the heaps of bullet stories that had never as yet been told. Thus, in self-defense I am compelled to relate a few of the tales that have been coming in as evidence that the lies I told are as nothing to the ones I am being told.

To begin with, let me relate the harrowing tale of a pioneer ancestor (by the way, no kin of mine), Elephant Snooks, the great and conserving rifleshot of the Smokies. On a gray and dismal day our hero fared forth into the Injun-saturated forest. The problem before him was plumb serious. He was hungry, plumb starved, and his poor little daughter was sick with the weezles, and about starved to death. Worse yet, our hero had but one bullet left in his pouch and about half a charge of powder. But, gripping his bottle of hair tonic in his left hand and his trusty rifle in his right, our hero proceeded, fearless as Hitler in 1939.

Well, our hero enters a cleared slashin' and across the way his eagle eye sees a thirsty Mingo hidden behind a big old stump. Instanter, and before said sneakin' Injun gits his old trader rifle lined on our hero's beezer, our hero takes in the situation and with a bloodcurdling yell sends his lonely bullet at the left eye of the murderin' redskin. There, you no doubt say, Elephant has throwed away his only bullet. He has saved his own life (of course, the Injun got hit in the eye) but he and his poor little daughter can't eat roast Injun. Does it mean that our hero and his poor little daughter must starve to death? Not by a dang sight! You don't know our hero.

Elephant ain't wasted no lead a-tall. Not our hero. He has so aimed that one bullet that him and his daughter never missed a meal. They never et no fried Injun, neither. Instead, they had deer meat, squirrel, and fried rabbit. And to top it all off, that trained bullet knowed its business, too. It come right back to its home in our hero's bullet pouch. Believe it or not.

If you can beat it, go to it. Which brings to mind the letter Paul St.-Gaudens of down Florida way wrote me, inspired by the bundle of true lies that I got together in that mystery lead explosion of mine. He says that he has three witnesses to the following, but to date he has never been able to make anybody believe the yarn.

It seems that back around 1930, Paul and his cousin Gus were living on Miami Beach, "which was almost a deserted village at that time, thank God!" About every Sunday the two boys together with a couple of pals would gather up all the guns and ammo handy and spend the day "at a lonesome beach about a mile above Baker's Haulover. Cousin Gus was a trigger-happy youth who knew that firearms were made to be shot and he couldn't stand seeing them lying around idle as long as there was a hull to be found. Having spent an hour or two one day popping at crabs, bottles in the surf, and Portuguese men-of-war, et cetera, we were taking a rest." Still quoting Paul's letter: "Gus' 62 Winchester .22 pump was propped up nearby with a full magazine. Half a dozen gulls were wheeling around over the Gulf Stream so far away they looked like white midges in the sunlight. They must have been 600 yards offshore. Suddenly Gus leaped to his feet, grabbed the .22, and said: 'Watch me knock down one of those so-and-so gulls.' He pointed the rifle roughly in the direction of the sky over Bimini and loosed a few quick shots. We all watched. In about six seconds one of the gulls suddenly folded up and plummeted into the drink. It wasn't diving for a bite to eat. Gulls don't go into a vertical dive from 200 feet or so. The rest of us were too impressed to say anything. So was Gus."

And here is another one that Mr. St.-Gaudens kindly included for your reading. One time up in New Hampshire he was out in the fields with a friend from New York. Of a sudden as they sauntered along, a gray squirrel jumped up and ran along a log about forty yards away. "Here's how we do it in New Hampshire," remarked Paul to his friend, at the same time firing his .22 rifle from the hip in the direction of the squirrel. To continue to quote: "The gray turned a double somersault in mid-air and collapsed on his nose. I tried to make it seem plausible, but I must have shown my own amazement as my friend could never be convinced that it wasn't a fluke."

And right here I'm going to add my two-bits' worth. Back in the days when saddle horses were used for something beside reducing, most of us young hopefuls out here in the West used to pack a six-shooter around. This was back in the days when we rode all day, anything the old S6 had to offer, for the magnificent sum of twenty-five dollars a month and all the good grub we could stow away. The main use of all this hip hardware was to shoot at rabbits and grouse, or to bang away at fence posts or aspens as we dusted along our way. One day as I was riding down a little creek and had just finished gathering a mess of trout with the old .38 Colt, a bunch of grouse fluttered up into some aspens just ahead of me. Grouse and trout go well together, so I stepped down off the horse and walking over shot almost straight up at the bird nearest me. Down it came, so I grabbed it up, tied it to the saddle and went my way. Later in the afternoon when I got back to the cabin and we were cleaning the grouse and trout for supper, my brother said to me: "Allyn, where'd you hit this grouse?"

"Darned if I know," I said.

"Bet you found it dead; there isn't a mark on it."

"I shot it," I said.

When we came to examine that bird there wasn't a scratch on it. Guess it took one good look at me and said to itself, "Well, birdies, here goes nuthin'." If you've got the answer, I ain't.

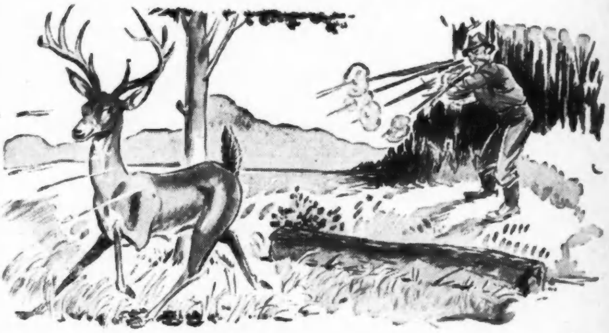
MORE FANTASTIC TALES OF HITS THAT SHOULDN'T HAVE BEEN, BY THE AUTHOR OF "MYSTERY LEAD"*

It seems that there is almost no limit to what can happen to a rifle bullet. Almost as hard to fathom at times are the actions of game animals. Homa Garner, a Camp Perry civilian team pal of my eldest son, brings both points out in the following yarn. One afternoon he had walked and walked round his pet deer country, but had seen nothing. Disgusted, he slung his Springfield over his back and set out for camp, looking neither right or left.

All of a sudden a big buck busted out of the timber and circled around him. Getting a slung rifle off your back is slow business, so by the time he had the rifle ready the buck was gone. Now on the alert, with rifle ready, Homa stalked slowly ahead toward a little park he could make out through the spruces where he halfway expected to see the buck again. There was no buck in evidence, so he crossed the park and entered the timber. He didn't go far, however, when on a hunch he turned and after a few minutes' delay slipped stealthily back to the edge of the park. Here he stood for several minutes, then presently became aware that not fifty feet from where he stood was the buck gazing out across the park looking for "that man." The one quick, true snap shot was all that was needed.

Hardly had Mr. Garner opened the carcass when his brother and two brothers-in-law who were at the time not far off came to where he was. From where they stood dressing the buck, one could see out across a deep, wide valley. And out there 450 to 500 yards distant soared a gloomy, croaking raven. One of those big, black fellows, blood cousin to the dismal croakers that flapped ominously over Attu and Kiska to add to the other troubles of our boys who fought there.

The men watched the big bird for several minutes. Without a word Homa's brother caught up his Springfield and, after what seemed an endless length of time for aiming, pulled the trigger. All four heard the bullet smack into the black feathers. All four stared as the bird of ill omen folded up and after a flutter or two vanished among the spruce spires below. You expect the story to end just that way, don't you? Keep your shirt on. A year later this same brother was again on the same spot hunting deer with another man. And there was, believe it or not, another raven out there over the valley two or three hundred yards away soaring around with apparently not another thing in the world to do.



"Watch me knock that so-and-so down," said Homa's brother, bringing his rifle up and taking aim. After some more nerve-racking aiming, he fired. Darned if he didn't hit his second raven! I didn't inquire whether Elephant Snooks is an ancestor of the Garner family or not, put personally I'm just a bit suspicious.

The other day Harold Dahl, another real hunter and rifleman member of the Colorado Rifle Club, told me about a friend of his who missed a buck three times running at not over fifty feet. This so disgusted the gentleman that later, when he saw another buck at 600 or 700 yards, he just threw his rifle to his face, and with a "here-goes-nothin' " yell, cut loose. Yeah, you guessed it. His bullet hit the deer in the ear, almost as dead center as Mister Snooks might have done.

By now I can hear some gent with bushy eyebrows and big pipe complain that he owns a sixgun and—okay, Brother, keep your shirt on and hold your horses. Read on. A number of years ago Dr. Fred H. Carpenter and his friend, Troy Riding, were hunting deer and/or elk, didn't make any difference which, when Doc jumped a bunch of grouse. Said grouse exploded into an aspen nearby and Doc rushed the cross hairs of his .270 Winchester onto the nearest head. Next instant the said pill dispenser decided that the roar of that old rifle

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*"Mystery Lead," Page 10, The American Rifleman, December, 1944.

might run the biggest bull elk in them thar hills clear out of the county, so he put down the rifle and pulled out his pet .22 revolver. Taking careful aim, Doc fired, and that particular grouse set its wings and left. What Doc said wasn't nice for polite society. And what he hissed when Troy yelled at him from over in a little park possibly 100 yards away will be deleted also.

"Some shot, Doc," yelled Troy, holding up a grouse. "How did you do it?"

Well, Doc doesn't know to this day how he did it. What he did was to miss the grouse he shot at, and the little 40 grain bullet slipped along through all the leaves and branches and finally landed pinwheel in an unsuspecting fool hen scratching for a living a good 100 yards from where he stood. Had Troy not been standing near where the bird was no one would have ever known what happened. Neither one knew the bird was there until it started flopping around.

Here is another for the six-gun clan. Once upon a time Jim Dunse and A. W. Peterson were shooting pistols out at the Colorado Rifle Club range from the shooting house at fifty yards. Now, in them good old days both Old Jim and A. W. were tough pistol competition, so that when either of them got a bad shot it was something to talk about. Thus, on this particular day, Old Jim blew his top when the pit boy suddenly marked him up a SIX. A. W. snorted with delight while Jim cut loose the finest score of Sunday school terms in a long while, ending up with, "Well! I'll be damned."

No use. You wouldn't guess what caused that six in a million years. A meadow lark flew across the range just in time to connect with Jim's bullet, headed straight for the ten-ring. Due to this slight interference it got Old Jim a measly six. Both Jim and A. W. claimed they were sane and sober and that this is a true story. Of course, had infallible Elephant Snooks been in Jim's boots that bullet would have cut a pinwheel and then possibly gone on to gather in a couple of rabbits.

One thing in regard to these crazy bullets is that too large a percentage of hunting field accidents is caused by them. One never knows where a stray bullet may land. My son has told me of how, during a lull in the battle for Brest, one of his platoon corporals was hit in the knee while he rested in a protected spot. The nearest firing was at least 2,000 yards away and this particular unit was not at that time under fire. Nevertheless, that wild bullet could find no other spot to land except in the knee of that American GI.

In this day and age, when we have steen times the humans roaming around that existed when Elephant Snooks and yours truly were kids, it's up to us all to be careful. Before you go shooting even a lowly .22 rim fire at some hawk or crow, or blaze away at a deer you *think* may be a buck (if it is a deer at all), DON'T. Unless you know your bullet has a backstop, don't turn it loose. Elephant Snooks had his one bullet trained: it never failed. But don't you be guilty of turning out a wild bullet that possibly will hit your pal in the head. Think and look before you shoot.

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The RIFLE for BIG GAME

(Continued from page 15)

from his wagon on his first trip. These Dutch four bores were muzzle-loaders, weighing twelve and one-half and fifteen and one-half pounds respectively, firing a handful (about sixteen to eighteen drams) of black powder behind a four-ounce belted bullet! Of them he says:

> "They kicked most frightfully and in my case the punishment I received from these guns has affected my nerves to such an extent as to have materially influenced my shooting ever since, and I am heartily sorry I ever had anything to do with them."

In 1875, Selous tried a single-shot .450 Martini-Henry military weapon, and liked it well enough to have Gibbs build him a .450 single-shot rifle on the Farquharson action. This had Metford rifling and handled a 365 grain bullet at 1,700 foot-seconds velocity. This Gibbs-Metford he used on all African game until worn out and replaced by a .303 single Holland Farquharson in 1894. This was for a hunting trip to Asia Minor and was supplemented with a .256 Mannlicher which his friends had persuaded him to buy for Scotch deer hunting. On his trip to America in 1897, he used both rifles interchangeably, and with equal success, on elk, deer, and antelope. But, in 1900, on his second trip to Ontario for moose and Newfoundland for caribou Selous brought only the .303 falling-block Holland. Again in Alaska in 1904, he used the .303, but in 1906, hunting with Charles Sheldon in the same territory on the upper Macmillan, he used a .375 Holland Farquharson single shot on moose, caribou, and sheep. In a letter to a friend he stated:

> "I am now using a .375 bore rifle by Holland, but I don't think it is any better for all ordinary game than my old .303 which got worn out."

And at another time, in reference to the ability of small bores, although he had killed over 100 elephants and well over 1,000 head of big game, he said:

> "Had I only had one of these rifles in my early days, I would have shot thrice the number of elephants I did."

The twenty-two hunters listed in this large-bore period used, in their various hunting careers, sixty-six rifles of thirty-seven different types—an average of three rifles apiece. These rifles were thirty-six large bores, nineteen medium bores, and twelve small bores, ranging in size from the single four bore of 1.05 inches to the .256 Mannlicher, with bullets from a quarter pound down to 160 grains. As an interesting sidelight on the professions represented, nine were army officers, three were gentlemen-hunters, six were professional hunters, one an administrator, one a minister of the gospel, one a naturalist-scientist, and one a rancher. *(To be continued.)*

◆ ◆ ◆

This Business of HEAD SPACE

By MAJ. GEN. JULIAN S. HATCHER

During the past few years we seem to have become quite head-space conscious. This can be good and it can be bad. Good if we know what head space means, and realize that guns and cartridges produced by many different makers must fit together, and that a certain amount of play is necessary to insure this fit. Good if we realize that this play must not be too great, and that very excessive head space can cause certain troubles and inconveniences. But bad if we imagine excess head space where it doesn't exist, or if we exaggerate the difficulties connected with it.

Just what is this business of head space? Let's get back to fundamentals a bit, and follow the thing through from the beginning of the term.

Most early cartridges had a rim, like the .22 Long Rifle shown in our first sketch. When such a cartridge is placed in the barrel of a rifle or pistol, the rim is the only thing that keeps it from going all the way in. When the bolt is closed, the rear face of the barrel is in front of the cartridge rim, and behind it is the front face of the bolt. Between the bolt and the barrel there must be enough space to accommodate that head or rim of the cartridge. This is the head space.

Most ordinary revolver cartridges are of the rimmed variety, though there are some notable exceptions, such as the rimless .45 automatic pistol cartridge as used in the Model of 1917 Colt and S. & W. revolvers. In some revolvers the cartridge rims rest against the rear face of the cylinder. In this case the head space is the distance from the cylinder to the recoil plate, which is that part of the frame which supports the cartridge head during firing.

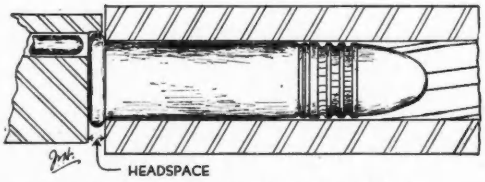


Figure 1: Head space in .22 caliber rim fire rifle is space between the face of the bolt and rear face of the barrel

Some revolvers, especially those made for rim-fire cartridges and for the ultrahigh-pressure center-fire loads, have the chambers counterbored so that the cartridges go in almost flush with the rear end of the cylinder, and each cartridge head is surrounded by a solid ring of metal. In this case the head space is the distance from the recoil plate to the shoulder against which the rim seats when the cartridge is in the chamber. In other words, it is just the rim thickness plus the necessary tolerance to accommodate ammunition of different makes.

Most revolver cartridges, such as the .38 Special, are straight sided, just like the .22 rim fire, and in these there is nothing but the rim to prevent the cartridge from going all the way into the cylinder. On the other hand, most high-powered rifle cartridges of the rimmed variety, such as the .30-40 Krag, shown in our second drawing, are tapered or bottlenecked so they couldn't go very far even if they didn't have a rim. These always have a clearance at the shoulder, as shown in the sketch, so that the rim will be sure to bear on its seat before the shoulder can come into contact with the chamber wall. When such a cartridge is fired, the brass expands until the case fits the chamber at all points, hence, in reloading, the clearance above mentioned does not exist. As long as the reloaded cases are used in the same rifle this makes no difference. However, if used in another gun of the same caliber, they might bear at the shoulder before the rim seats, and difficulty would then be experienced in closing the bolt.

A TIMELY SURVEY OF HEAD SPACE PROBLEMS . . . WHAT ARE THEY, AND HOW DANGEROUS CAN THEY BE?

When repeating rifles having box magazines first came into use it was found that rims on cartridges made it difficult to produce magazines that would feed the cartridge smoothly. To overcome this difficulty, two new types of cartridge were produced. These look much alike on casual inspection, but are quite different in principle. These are the rimless type, and the semirim, or as it is sometimes called, the semirimless.

The semirim type is seen in such well-known cartridges as the .351 and .401 Winchester self-loading and the .25, .32, and .38 A.C.P. The latter is illustrated in Figure 3. The rim is made very little larger than the body of the cartridge, and there is a groove or cannelure cut into the body just forward of the rim, for the extractor to fit into. The semirim type works just like the rimmed cartridge. Even though the semirim is ever so little larger than the body of the case, this little is still enough to stop it positively at the right place.

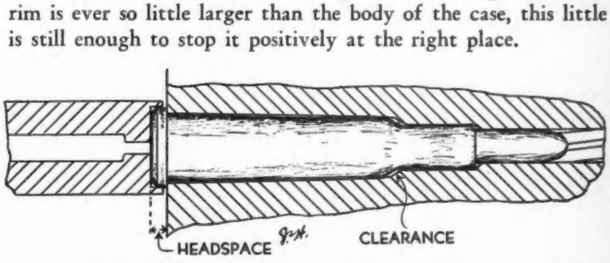


Figure 2: The .30-40 Krag is a typical rimmed rifle cartridge of the "bottlenecked" variety. Note clearance at neck, which insures proper fit at the rim

Here also, head space is a distance equal to the thickness of the rim plus the necessary tolerances to enable different makes of gun and cartridge to fit together.

The true rimless cartridge has a head which is no larger than the body of the cartridge at some forward point. It has a groove or cannelure cut around it just forward of the rim, for the extractor to hook into. As the rim is no larger than the body, it cannot be used to limit the forward motion of the cartridge when it is seated in the chamber, and this must be accomplished in another manner. With the .45 A.C.P. cartridge this is done by leaving the forward end of the cartridge, that is, the mouth, square, instead of crimping it onto the bullet as is done with most other pistol or revolver cartridges. A square shoulder or ledge is left at the front end of the chamber and the mouth of the case seats against this.

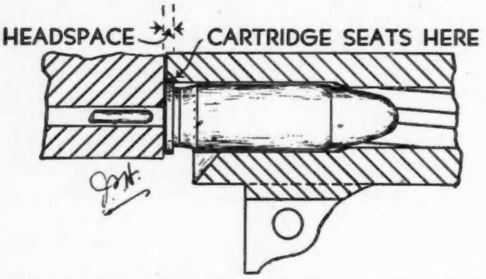


Figure 3: The semirim .38 ACP cartridge has a clearance at the mouth of the case, and seats on the slightly enlarged rim

As there is nothing for the head or rim to seat against, head space, in the old meaning of the term, has no significance, and when we want to determine tolerances as to cartridge seating we have to measure all the way from the breechblock to the shoulder at the front of the chamber. For convenience, we now call this distance "head space" when speaking of guns using rimless cartridges.

When the Mauser repeating rifle was designed, the inventor introduced the well-known rimless rifle cartridge, of which the .30-'06 is an example. As shown in Figure 5, this cartridge seats on the tapered shoulder which connects the body of the cartridge to the neck. Hence, in a high-powered, rimless rifle cartridge, the distance from the face of the closed bolt to some reference point on the shoulder in the forward part of the chamber is, for convenience, and for want of a better term, called the "head space." Note that the principal contact which positions the cartridge in the chamber is at the same point where a clearance is purposely left in the rimmed variety.

As a practical matter, it is impossible to measure this kind of head space without special gauges, because the shoulders on both the cartridge and in the chamber blend into the slopes ahead of and behind them, and there are no sharp edges to measure from. Actually, the 1.940-inch minimum to 1.944-inch maximum head space of the '03 Springfield rifle is measured to a hypothetical intersection which does not exist and can only be located by measuring to a given point on a ring gauge that fits over the tapered shoulder of a steel gauge shaped like a cartridge. This will be better understood by reference to the official drawing for the .30-'06 head space gauge, which is shown in simplified form, retaining the essential dimensions but omitting many confusing cross references.

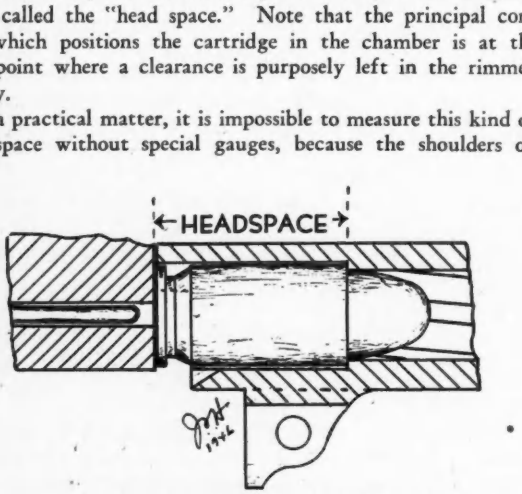


Figure 4: The .45 ACP cartridge is truly rimless, and seats on the square mouth of the case. No clearance can be allowed

There is still another variety of cartridge to consider. This is the belted type, as used in the H. & H. Magnum and similar rifle cartridges. As shown in Figure 7, it is really a modified rimmed cartridge, having a very wide and very shallow rim. The rim is not high enough to give a good place for the extractor to take hold, so there is an extractor groove cut into the rim itself. To explain it another way, it is like a rimless cartridge with a slight step just ahead of the extractor groove. In seating the cartridge, this step comes to rest against a slight corresponding ledge in the chamber. This gives the same effect as that of a rimmed cartridge, and like it, always has a clearance at the shoulder until after it has been fired once.

We hear a lot of talk about excess head space; just what effect does it have? One result, obviously, is to let the cartridge move away from the breechblock when it is struck by the firing pin. This, in effect, results in a shorter firing pin blow, and if very excessive, may cause hangfires or misfires. For example, it is quite possible to fire the .45 A.C.P. cartridge in the .455 Webley and Scott automatic pistol, even though, for this cartridge, there is one-eighth inch excess head space. If the cartridges are loaded into the chamber singly, they go in so far that neither the firing pin nor the extractor can reach them, and they will not fire; but if they are loaded from the magazine they rise up under the extractor hook and this holds them close enough to the breechblock so that the firing pin can strike the primer, and they fire, extract, eject, and reload just as if they were intended for this gun, in spite of that eighth inch of excess head space.

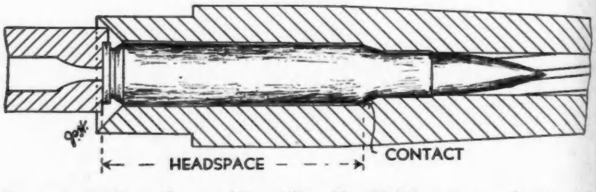


Figure 5: Rimless rifle cartridges, like this .30-'06, seat on the tapered shoulder of the chamber. This type causes most head space problems.

Also, to check the matter, a Colt New Service Revolver, caliber .45, Model of 1909, was fired with the .455 Webley Revolver Cartridge Mark II and with the .455 Webley & Scott automatic pistol cartridge, with excess head space of .037 and .025 inch respectively, and a Colt New Service Revolver, caliber .455 was fired with the .45 A.C.P. cartridge at excess head space of .051 inch. Accuracy was excellent and no bad results were noted from the excess head space.

In general, with the straight-sided, low-pressure, center-fire cartridges, like the above, head space causes no trouble other than possible hangfires or misfires. It should be noted, however, that .22 rim-fire cartridges are particularly sensitive to ignition, and variations in firing pin blow due to excess head space may cause velocity variations that will interfere with fine accuracy. Moreover, unless well supported at the head, the rims may blow out and allow a dangerous leakage of gas.

Shotgun shells come in the category mentioned above, of rim cartridges with straight sides and low pressures. A moderate amount of excess head space seems to make little or no difference. A very large amount, say a tenth of an inch or more, is dangerous, as there is nothing but the wall of the case to hold the pressure where the shell is unsupported in the space between the end of the barrel and the face of the breech. Not long ago an acquaintance told me that his pump gun worked hard, and the shells were bulged ahead of the rim. I found that he had assembled his gun with the barrel just two threads forward of being fully seated in the receiver, and as the barrel has twenty threads per inch, this gave him exactly one tenth of an inch more head space than he should have had.

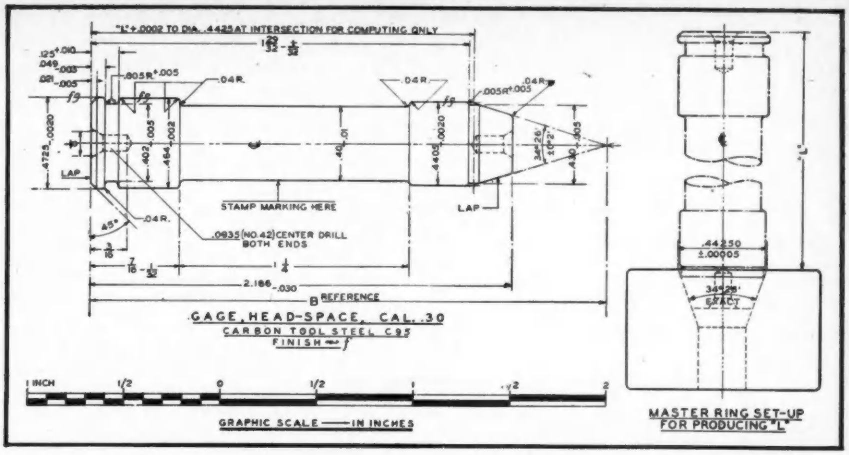


Figure 6: This is the official drawing for Army's .30-'06 head space gauge. It is shown in simplified form, with cross references removed. Ring gauge for checking is at right

A few weeks ago, Al Barr and I were out patterning some shotguns, and I assembled an Ithaca pump gun this way, and fired several shots with Federal Monark and Federal Hi-Power loads. I fired these shots myself from the shoulder, but was careful to wear my Raybans, and to keep my left forearm away from the ejection opening in the bottom of the gun, in case the head of one of those shells failed to hold the pressure. Patterns were the same as usual, and everything worked all right, except that extraction was a trifle hard, though not excessive. The fired shells were swelled out, as shown in Figure 8, but they held together in spite of that one-tenth-inch excess head space, and no harm was done.

Most pump-action shotguns, Winchester and Remington, for example, cannot be misassembled in this way. The factories have put in mechanical devices to prevent it. It is understood the others will do the same in the future.

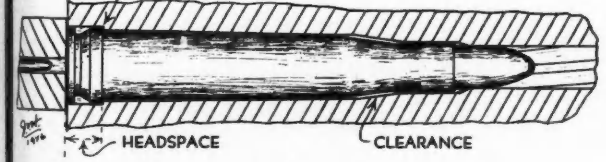


Figure 7: Belted cases like the .300 Magnum are simply rimmed cases having a wide rim and an extractor groove. Note that chamber clearance is present

With bottlenecked cartridges, whether rim or rimless, the matter is quite different. The powder gas pushes back on the base of the cartridge with several thousand pounds pressure, and exactly the same total pressure is exerted in a forward direction, part of it on the base of the bullet and the rest on the tapered inside of the case body and shoulder. This pressure forces the forward part of the cartridge case tight against the shoulder of the chamber and at the same time drives the head of the case back against the face of the bolt. If there is excess head space, the case will be stretched; if the head space is too excessive, the case will be separated or ruptured at a point about one-half inch from the head, where the thick brass in the base of the case begins to thin out as it joins the walls. When the gun is opened, the base of the cartridge will come out with the extractor, but the forward part of the case will remain wedged in the chamber and the gun cannot be used again until this is removed.

Lever-action rifles are more subject to this trouble than are bolt-actions, as the lever actions tend to stretch and spring. However, with good strong actions and moderate pressure loads, and especially if shooting glasses are worn, this trouble is not particularly dangerous, but it is annoying and inconvenient. Very little, if any, gas escapes to the rear, because the back end of the cartridge, which remains in the chamber, acts as a seal. In fact, it is just such short brass cups that the Germans have for years used as breech seals in their heavy artillery, instead of the "mushroom head" and gas check pad of our big gun system.

It happens that I have had an unusual amount of personal experience with this matter of excess head space and separated cases. In 1916 and '17, as a captain of Ordnance, I had charge of Army machine-gun schools, on the Mexican Border, and then at Springfield. In those days, Frankford Arsenal made .30-'06 cartridge cases of very hard brass to make extraction easier and to improve their functioning in machine guns. These hard, brittle cases gave marvelous operation when head space was normal, but they would separate in a hurry if the head space was the least bit over the limit. The automatic machine rifle, caliber .30, M1909, had detachable barrels, held on by a nut which could be tightened with a spanner. The least loosening of this nut caused so much excess head space that the case ruptured and the gun jammed because the following cartridge could not chamber fully. The ruptured case extractor was about the most important part of each gunner's kit. I experimented until I found how to fix the guns so they would fire a few shots, then chop off a case and jam.

Every student had this situation thrown at him repeatedly until he could correct it in the dark. In my own experimental firing I encountered at least a hundred such separations, and every one of my several thousand students had to experience and correct this situation several times. I never saw enough gas escape to hurt any one. However, bear in mind we were using the old .30-'06 cartridge with 150 grain bullet at 2700 feet per second and with only 50,000 pounds pressure. With some of the superhigh-intensity loads that are being used today, any head space over the normal can be dangerous.

In 1917, Frankford Arsenal began making the cases much softer, just to get away from these separations. The soft cases have been continued up to the present time, except for a few lots marked "R" (for rifle), and intended for the National Matches.

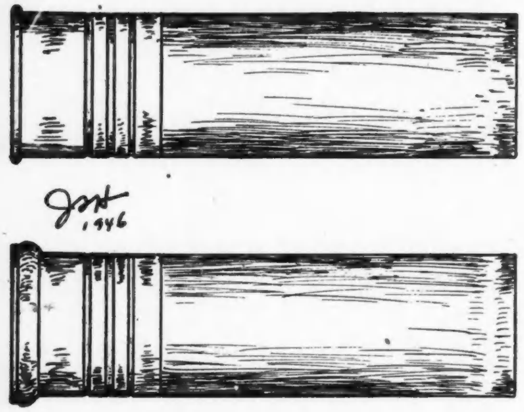


Figure 8: These two drawings show effect of excessive head space in shotguns. Above, shell fired in gun with normal head space, and below, swelling of base caused by tenth inch of head space

These softer cases stick badly in a hand-operated rifle when it heats up in rapid fire, but will stand a tremendous amount of stretching without an actual rupture.

Symptoms of excess head space can be plainly seen on the cartridge case if you know what to look for—see Figure 9. The first thing that happens is a stretch, indicated by a bright zone extending all around the case about a half inch from the base. As the head space gets worse, the stretching shows up in a more pronounced manner, and the beginning of a crack running around the case may be seen. The next step is actual separation.

One situation in which excess head space can become very dangerous is when the receiver and bolt are glass-hard and very brittle, as was sometimes the case with Springfield receivers of the old heat-treatment made before 1918. Like a razor blade, these are strong to any direct pull, but have low resistance to shock. Excess head space allows the bolt to have a certain amount of play. When the explosion occurs, the bolt can move back and then stop suddenly against the locking shoulders, striking them a smart blow which, with one of these old glass-hard receivers, may cause it to shatter.

On the other hand, with receivers which, instead of being hard and brittle, are tough and elastic, like the double heat-treated Springfields numbered over 800,000 and the nickel-steel Enfields and late Springfields, such a hammering by the bolt, due to excess head space, may cause a gradual stretching, but cannot cause either the receiver or the bolt to shatter.

In the 1903 Springfield, the Model 1917 Enfield, and other rifles using the .30-'06 cartridge, the proper head space, measured from the face of the locked bolt to the reference point on the shoulder of the chamber, is 1.940 inches or a little over. In the manufacture of new Springfields, the specifications required the head space (after proof firing) to be not less than 1.940 inches and not over 1.944 inches. When rifles were returned to the arsenal for overhaul, the head space on rifles repaired and ready for reissue could not be over 1.946 inches. When rifles in the hands of troops were inspected, those having head space over 1.950 were returned for overhaul. Model 1917 Enfields sold through the Director of Civilian Marksmanship are inspected with the 1.946 gauge. If this will go, the 1.947 gauge is tried, and, if it will not go, the rifle may be sold; if it does go, sale is not permitted.

There is a large amount of misinformation going around about this matter of head space in the 1917 Enfield. A number of letters have been received from members, complaining of Enfield rifles with head space over 1.950. I have checked a number of these guns that were said to have excess head space, and in each case the head space was well within limits; usually around 1.943 or so. Not long ago the owner of a shop which has recently gone into the business of converting Enfields to sporters came and asked to have their gauges checked as they had just received several Enfields that were over 1.950 and were afraid to convert such guns. After the gauges were found to be okay, the guns themselves were checked. First, the firing mechanism was taken out of the bolt, then the extractor was removed, leaving the extractor collar in place, after which the 1.950 gauge was inserted, and the bolt was pushed forward and the handle turned gently toward the closed position until resistance was felt when it was about halfway down. This was repeated with a smaller gauge; the handle went down almost all the way, but not quite. The bolt finally closed on the 1.943 gauge in one rifle and the 1.944 gauge in the other; just about perfect.

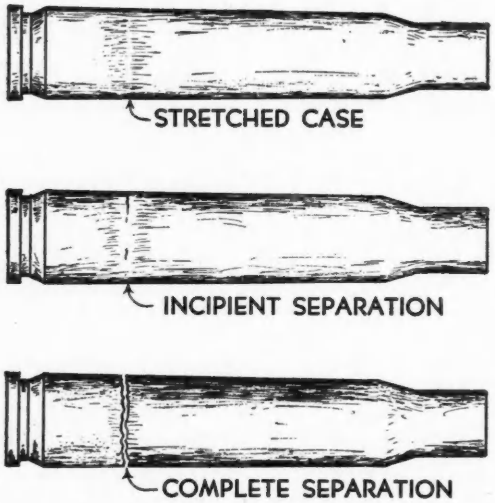
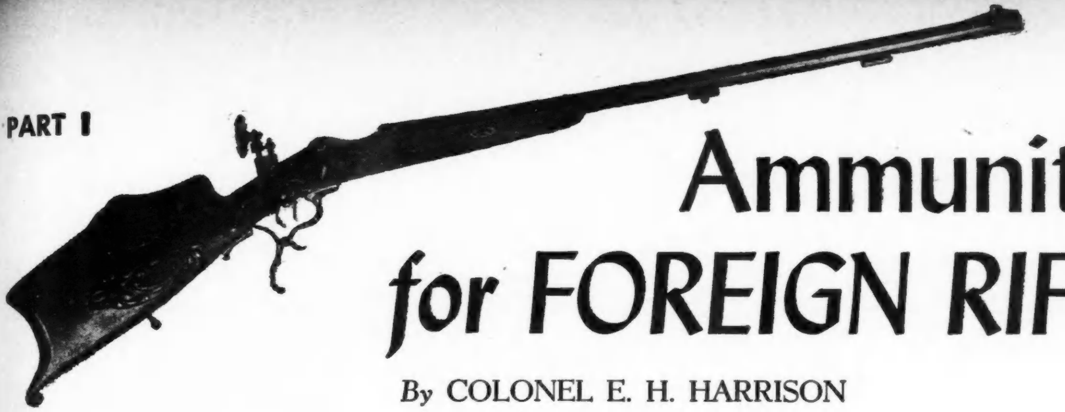


Figure 9: Cartridge cases are good indicators of the presence of excess head space. Watch for these signs in your fired cases

The shop foreman said that two "gunsmiths" had come in and showed him how to take head space. Their system was to insert the gauge and close the bolt as hard as possible, with the extractor and firing mechanism in place, and then try to snap the trigger. If this could be done, they considered that the gun had accepted the gauge! I wonder if these two "gunsmiths" use a micrometer caliper by squeezing it down as far as it will go with a Stillson wrench before reading the graduations?

Recently a member wrote that his newly purchased 1917 had

(*Continued on page* 41)



PART I

Ammunition for FOREIGN RIFLES

By COLONEL E. H. HARRISON

All too often, a fine German or Austrian rifle turns out to be only an ornament because no ammunition can be found for it. To say that the loss is small is not entirely fair. European sporting arms are products of long evolution and adaptation to existing conditions, just as are ours, and they will fit our needs when we shoot under conditions comparable with those of Europe. In the majority of cases this means forest shooting, often combined with the requirement that the same gun serve for several kinds of game. But, even if one's requirements differ from these, the true "gun nut" is not going to be satisfied unless he can use his fine German gun—on targets if nothing else. Which brings us back to our problem of ammunition.

FINDING THE RIGHT AMMUNITION FOR THAT GERMAN WAR TROPHY CAN BE TRICKY, UNLESS YOU KNOW ALL THE ANGLES . . .

Actually, it is almost always possible and, as a rule, quite practicable to provide satisfactory rifle ammunition for a European sporting arm. The owner of one of these guns can read enough of what follows to enable him to determine where his own problem lies and, thereafter, concentrate along the lines indicated for his particular case. The examples listed are so chosen as to include practically all cartridges which have been in common use in Central Europe.

When ammunition for the arm is manufactured in the United States, it is necessary only to identify the proper cartridge. This presents far more possibilities than might be expected at first—fortunately so, since it is the first thought of the average man, and the best solution. It is a familiar fact that a number of European calibers have been adopted by ourselves, or are sufficiently used in arms of foreign make to have justified manufacture of ammunition in this country. It is not generally realized, however, that a corresponding process went on in Europe, particularly in Germany and Austria, where several distinctively American calibers came into general use. This does not refer merely to arms manufactured in Germany for export to the United States, which at different times were made for such American cartridges as the .38-55, .30-30, .25-35, and .30-'06. These almost always are very plainly marked with the proper American cartridge and no doubt arises. We concern ourselves here with arms made originally for use in Europe. Sometimes American calibers in these were rechristened according to the German system of cartridge nomenclature.

The following table gives all the cartridges common to the United States and continental Europe, and used in European rifles and combination guns to any significant extent:

German Name	*American Name*
22 (5.6 mm.) kurz	.22 Short
22 (5.6 mm.) lang	.22 Long
22 (5.6) mm. lang fur Büchsen (l.f.B.)	.22 Long Rifle
5.6 x 35 R Vierling	.22 Hornet
5.6 x 52 R	.22 Savage High Power
6.5 x 41 R	.25-20 Winchester
6.5 x 52 R	.25-35 Winchester
6.5 (or 6.7) x 53 Mannlicher-Schöenauer	6.5 mm. Mannlicher*
7 x 57	.7 mm. Mauser or 7 mm. Spanish Mauser
7.62 x 51 R**	.30 WCF (.30-30)
7.62 x 63**	.30-'06
8 x 56 Mannlicher-Schöenauer	8 mm. Mannlicher-Schöenauer
8 (or 7.9) x 57 J	8 mm. Mauser
9 x 57	9 mm. Mauser*
11.15 x 60 R	11 mm. Mauser*

When the German or Austrian arm is identified as being chambered for one of the above calibers, either by the manufacturer's markings or by a sulphur cast of chamber and bore (which can be made by a competent gunsmith if the shooter does not care to do so), the use of the correct American ammunition in it is as safe and proper as in an equivalent American arm. On the other hand, the use of American cartridges in the absence of such identification, to "make it do" or for any other reason, is dangerous no matter how well constructed the arm.

The German system of cartridge designation consists of two figures, 7 x 57 for example. The first is the nominal caliber and the second the length of the cartridge case. Both figures are in millimeters. For rimmed cases the letter R (*rand*, the German word for rim) is added, and other letters or words may be used for additional identification. Some makers, especially the smaller ones, had ideas of their own as to the actual numbers to be used in designating bore sizes. Figures from 7.8 to 8.1 are found on barrels with bores within nominal 8 mm. dimensions. These German figures should not be taken too seriously, and reliance should be placed instead on actual bore measurements.

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* Understood that manufacture will not be resumed, but some quantities should be available.

** Rare.

Some of the cartridges on our list call for additional comment:

.22 Vierling. Though few Americans had heard of this cartridge until recently, it antedates the Hornet. Since the two cartridges, Vierling and Hornet, were developed separately (though from the same .22 WCF cartridge) they are not identical. However, it is found in practice that rifles chambered for the Vierling generally will handle Hornet ammunition satisfactorily. In the few individual rifles which might not, it becomes simply a matter of rechambering for the Hornet.

6.5 mm. Cartridges. The 6.5 mm. Mannlicher-Schöenauer cartridge (6.5 x 53 Mannlicher-Schöenauer) has been available in this country for many years. Unfortunately, this is not true of Mauser sporting rifles in this caliber, which are chambered for the 6.5 x 54 or the 6.5 x 58. Other German makers of rifles on Mauser actions favored a third cartridge, the 6.5 x 57. The 6.5 mm. Mannlicher-Schöenauer cartridge is *not* an acceptable substitute for any one of these three. It is too long bodied to chamber in 6.5 x 54 mm. rifles; in 6.5 x 57 and 6.5 x 58 chambers it is too short bodied and gives excess head space, which is very dangerous. The problem of loads for any Mauser rifle chambered for these cartridges demands resizing of a similar American cartridge case in order to handload ammunition.

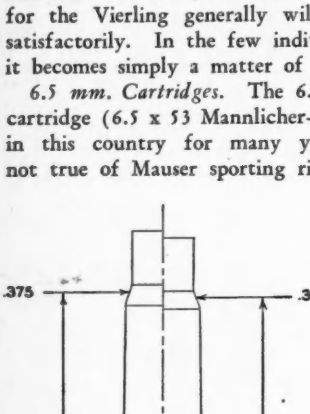


Fig. 1: The short 8 mm. Mannlicher-Schoenauer cartridge, fired in a rifle chambered for the 8 mm. Mauser cartridge, gives the same effect as excess head space of .030-inch

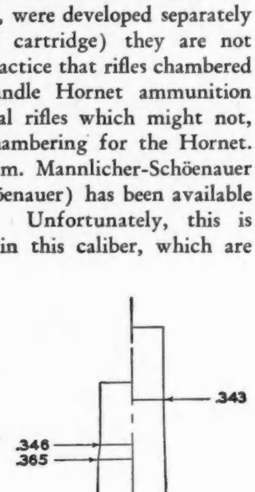


Fig. 2: Most German Schuetzen rifles, like that shown on page 33, are chambered for 8.15 x 46 cartridge. These rifles can easily be rechambered for the standard .32-40 case

8 mm. Cartridges. The confusion over this caliber is notorious, and only in recent years has the cartridge begun to be understood in the United States. It must be understood first that there are perhaps a dozen 8 mm. cartridges, rimmed and rimless. Some notice of these is given later on in this article. Until recently, however, there have been only two of these in this country in any number, and it is these we are considering at present. They are the 8 mm. Mauser (8 x 57J) and 8 mm. Mannlicher-Schöenauer (8 x 56). The misunderstanding concerning them is due to a combination of three separate circumstances.

It is widely known that in the early 1920's many 8 mm. military rifles were converted into sporters for export to the United States, under conditions which removed any dimensional control. Since that time, almost every unexplained feature of the 8 mm. caliber has been attributed to that period.

Entirely aside from the above, 8 mm. German military rifles have been made to two different *standard* bores. The 8 x 57J cartridge (the J stands for *Infanterie*) dates from the adoption of the Model 1888 rifle, and remained unchanged when the model 1898 rifle came in. The bullet diameter was .318 inch and the barrel groove diameter about .320. In 1905, when the bullet was shortened and changed to Spitzer form, the grooves of the standard barrel were deepened some .0025 inch, which made the groove diameter .325. The bullet diameter was correspondingly increased to .323 inch. However, many Model 1888 rifles and perhaps a few unmodified M1898's remained in existence, and sporting 8 mm. barrels generally continued to be made to the old groove size. These facts are perfectly understood in Europe, and no one would think of interchanging bullets between the two types of bore.

In supplying cartridges, our ammunition manufacturers were faced with the fact that most shooters owning an 8 mm. rifle, either 1888 or 1898, would be prone to use any 8 mm. ammunition they could get their hands on, without regard to distinction between the two. They decided to develop a cartridge which would be safe in either type, and so loaded small, soft bullets which perform reasonably well in either bore.

The only dangerous confusion would be that between the 8 mm. (8 x 57J) Mauser and the 8 mm. (8 x 56) Mannlicher-Schöenauer cartridges. There are both Mauser and Mannlicher-Schöenauer cartridges in 6.5 mm. as well, and in fact this doubling occurs through almost the whole range of calibers, with the two differing just enough to make them noninterchangeable. German ammunition manufacturers were always careful to mark cartridges for Mannlicher-Schöenauer rifles as such, to avoid any possibility of mixing with Mauser. In these two 8 mm. calibers, the difference in over-all case length of 1 mm. is not important, but the fact that the body length of the Mauser (which determines head space in rimless cartridges) is about .030 inch greater than that of the other is important. These are compared in Figure 1. If cartridges made to proper dimensions are used, an 8 mm. Mannlicher-Schöenauer cartridge fired in a Mauser chamber will produce the usual consequences of excess head space—a separated case and dangerous escape of gas to the rear.

Notwithstanding, in the past some American manufacturers have put out 8 mm. ammunition marked ambiguously as for both Mauser and Mannlicher rifles. While this is correct from a technical standpoint (since the Model 1888 rifle is a Mannlicher), the majority of persons would take it to mean that the ammunition is suitable for both Mauser and Mannlicher-Schöenauer rifles. Such labeling is far from admirable. The safest course for the user of one or the other of these 8 mm. rifles is to fire only ammunition which is clearly labeled as intended for his particular rifle, or at least labeled plainly as to whether it is or is not for Mannlicher-Schöenauer rifles.

The 8 x 57JR cartridge, which will be covered in more detail later on, is the rimmed counterpart of the 8 x 57J, and is found in many three-barrel guns now in this country. Standard German ammunition for it is loaded to the level of the mild-intensity ammunition intended for the Model 1888 rifle. American "8 mm. Mauser" sporting ammunition is of similar loading and can be fired in 8 x 57JR arms, but the extractors of such guns cannot engage the rimless case, which is an inconvenience. Before such firing, the cartridges must be tried in the chambers of the dismounted barrels to see if they are supported with their bases flush with the breech face of the barrels and thus do not give excess head space. The use of German 7.92 mm. military ammunition in 8 x 57JR arms is dangerous. Military ammunition for the Model 1898 rifle and other modern military weapons develops much higher pressure than the Model 1888 loading used in 8 x 57JR ammunition. Further, most 8 x 57JR arms have the old-style .320-inch groove diameter already mentioned, and the hard .323-inch military bullet in such a bore will increase pressures still more. This caution applies also to the use of such military ammunition in any 8 mm. sporting rifle, unless it has been verified that the groove diameter is at least .323 inch.

Rechambering for an American cartridge, when successful, provides a complete solution to the ammunition supply problem, and it very naturally is strongly attractive. Most unfortunately, it is almost never practicable.

The reason is that, in the parallel development of European and American calibers, chance has failed to provide the dimensional coincidences necessary for success in rechambering. These are that the new cartridge must be of the same *type* and *about* the same size as the original, and the groove size of the barrel must be suitable for the new cartridge. While quite often an American bullet can be found which is of satisfactory size for the barrel, it almost never happens at the same time that the arm can be rechambered for the American cartridge using that bullet. For example, many 8 mm. barrels can be fitted with .32-40 or .32 Special bullets, but almost no 8 mm. chamber is small enough to rechamber for either of those cartridges. Again, the .35 Remington is too small for use in rechambering 9 x 56 Mannlicher-Schöenauer rifles. The .35 WCF is large enough, but its rimmed head makes it entirely too big for either the bolthead or the magazine. While the number of European cartridges is too great to permit a complete cartridge-by-cartridge demonstration of these facts, such as can be done in the simpler case of Japanese calibers, the reader can satisfy himself by investigating the chamber and bore dimensions of his own European arm.

Even with as well-known an arm as this German service rifle, mistakes can happen. Getting the wrong ammunition may lead to nothing more serious than poor accuracy—or it can land you in the local hospital

The single outstanding exception is the 8.15 x 46R. This was the universal Schuetzen cartridge (Schützen-hülse) in Germany and Austria, in contrast with the American Schuetzen rifle which was used in a number of calibers besides .32-40. The 8.15 x 46R caliber also is found occasionally in three-barrel combination guns, and in Mauser and Mannlicher military-type rifles made for the militia of certain Alpine districts. The chamber is slightly shorter than that of the .32-40, the groove size is suitable, the two types of cartridge are compatible, and rechambering to .32-40 is quite satisfactory. The 8.15 x 46R is very slightly bottle-necked, and the shoulder may not clean up entirely when the .32-40 chambering reamer is used (Figure 2). This will result in the appearance of a slight shoulder on .32-40 cases fired in the new chamber. That does no harm, but if it is objected to, rechambering may be for the .32 Winchester Special cartridge, which will clean up the chamber completely.

If fired cases are available for your foreign rifle, ammunition can be had by handloading. The principles of handloading for foreign rifle cartridges are exactly the same as for our own. The additional problem which they present is that of obtaining suitable components. Even this problem really is not so unusual as it may appear.

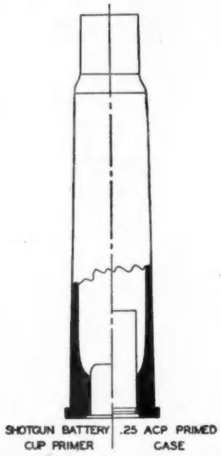


Fig. 3: Cases using old Berdan primers, which are not available in US, can be reloaded by adapting primer pockets to shotgun primers or by inserting small pistol cases

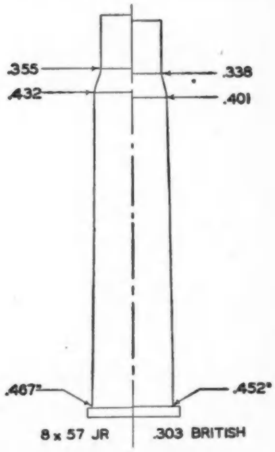


Fig. 4: Cases for some German calibers can be improvised by "blowing out" readily available US brass. This will be described in the January 1947 AMERICAN RIFLEMAN

The best handloading instruction for any cartridge is, and always has been, to use published information as a guide and limitation, in the light of the construction of one's own rifle, its groove size, the results obtained on test, et cetera. Accordingly, the first step in handloading for any foreign cartridge is to determine the groove size of your rifle, by lead slug or by sulphur cast extending into the bore. Then a bullet to fit may be selected from available American bullets.

Jacketed bullets of American manufacture are available for nearly all European rifles up to 8 mm. bore. Specifically, the two smallest calibers among the important European center-fire cartridges are the Vierling (Hornet) and the .22 Savage High-Power—two standard American calibers. Though only

(*Continued on page* 38)

KIRKSITE BULLETS

By ROBERT HUTTON

THE SHORTAGE OF JACKETED BULLETS and the difficulty of obtaining lead alloy for cast bullets during the past few years has caused many an imaginative shooter to turn to other materials for handloading.

What some of us found is a new material that makes better cast, gas-check bullets than lead alloy, and cheaper bullets than jacketed ones. Which introduces "Kirksite A," commonly called Kirksite or just plain "kirk," a new alloy, born of wartime needs for purposes far removed from bullets. I believe, after having made nearly one thousand tests in various rifles, that Kirksite will prove a contribution to the art and science of good shooting—after the material has become better known.

This much may be said of Kirksite bullets now. They may be moved at better velocities than the hardest lead-alloy bullets with gas-check bases. They are accurate to 200 yards and trajectory, at this distance, is fairly flat. They are considerably lighter than lead and, therefore, lose velocity fast after 200 yards.

So far as I have been able to find out, no Kirksite loads have been chronographed; indeed I have not been able to find that anyone else has experimented with them. The manufacturers, when questioned, did not know that they were producing an alloy that made good bullets.

Casting Kirksite bullets is not difficult. No dross appears and fluxing is unnecessary. Kirksite does require more heat than lead—about 600 degrees Centigrade (about 1,100 F.). A kerosene stove in your barn just won't melt Kirksite. So far as I have noted to date, no damage to the several kinds of standard bullet molds I have used has occurred.

Otherwise, Kirksite bullets are made with exactly the same technique as lead-alloy bullets. They may be resized in standard dies with no difficulty. Gas checks should be used only if the design of the bullet calls for gas checks. Lubrication—and for the moment I'm deliberately being a bit vague—seems to be optional. It is too soon to decide whether it has the same tendency as zinc to "plate" the bore. I have not tried these bullets without lubricant but I intend to take the chance on an old gun to see what happens. I have used Ipco wads with considerable success in loads that have been fired accurately at about 3,000 feet per second.

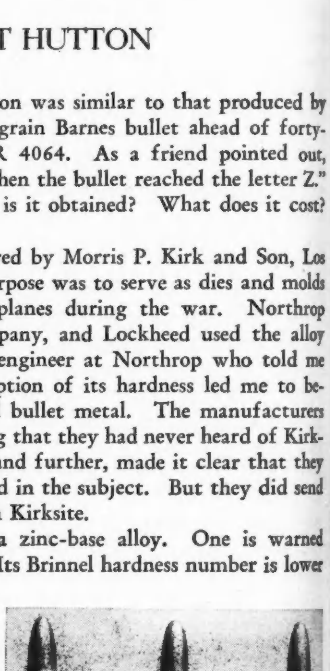
Tests on small game and Sears' catalogues seem to show that the heavier Kirksite bullets, in calibers such as .30-'06, would be adequate for deer at shorter ranges. Also a metropolitan telephone book, soaked in water for an hour, and then assaulted at fairly close range with a .257 Roberts Kirksite bullet, didn't look much like a telephone book after the assault. Expansion of bullet and general destruction was similar to that produced by the same rifle and the 100 grain Barnes bullet ahead of forty-one grains of du Pont IMR 4064. As a friend pointed out, "Expansion was complete when the bullet reached the letter Z."

What is Kirksite? How is it obtained? What does it cost? Who makes it?

Kirksite A is manufactured by Morris P. Kirk and Son, Los Angeles, California. Its purpose was to serve as dies and molds in the manufacture of airplanes during the war. Northrop Aircraft, the Douglas Company, and Lockheed used the alloy extensively, and it was an engineer at Northrop who told me about Kirksite. His description of its hardness led me to believe it would make a good bullet metal. The manufacturers sent me a polite letter stating that they had never heard of Kirksite being used for bullets, and further, made it clear that they were not especially interested in the subject. But they did send me an elaborate brochure on Kirksite.

Kirksite is described as a zinc-base alloy. One is warned against adding tin or lead. Its Brinnel hardness number is lower than many other alloys, but it seems to resist wear because of what the manufacturers advertise as a "natural oilines or self-lubricating property . . . and it will not scratch sheet metal."

It is for the latter reason that I intend to continue some experiments without lubrication. But even if these experiments are successful, I don't see that it adds anything of real import; it is very simple to slip an Ipco wad under a bullet, jacketed or alloy, and these wads surely do not destroy accuracy and they do add to barrel life. In the instance of Kirksite bullets, I do not believe pressure will become a problem. So far as powder and primer are concerned, they consitute medium-range loads. Actually, the velocity is right up in the higher brackets. That's the advantage of Kirksite.



Some .257 cartridges with 55 grain Kirksite bullets, and a few of the author's 109 grain .38-40 slugs in Kirksite

Cost is about twelve cents a pound, or roughly that of lead or linotype metal. Its weight is approximately 60 per cent that of lead.

The manufacturers do not care to divulge the formula, but they do emphasize the fact that the metal will become contaminated if tin or lead is added. I see no reason for trying to change the alloy of Kirksite anyhow. These bullets constitute the best cast alloy I have tested to date. I am informed that it may be purchased at practically any establishment dealing in metals and alloys, or direct from the manufacturer. It is supplied by the manufacturer in ingots weighing approximately thirty-two pounds each.

Finding proper loads for Kirksite bullets presented quite a problem, since they weigh considerably less than lead or jacketed bullets of similar size. Most of the loading data supplied by the powder companies, by Ideal, Belding and Mull, and J. Bushnell Smith, therefore, are of little—if any—help. You are on your own with Kirksite.

The loads and results reported herewith have been tested by the writer and friends, and in no instance was an indication of anything but mild pressures apparent. Also, the object—and upon this object I believe the usefulness of Kirksite bullets depends—was to drive bullets faster than lead alloy bullets could be driven, with safe pressures—and reasonable accuracy. I think a great many experimenters will wish to test these and similar loads further for killing power. That factor remains, at the moment, a dubious one, though reports published several years ago in THE AMERICAN RIFLEMAN showed that zinc bullets were effective on bear and deer. I believe Kirksite will have a similar effect.

HAVING TROUBLE FINDING ENOUGH LEAD? THIS NEW ALLOY MAY BE THE ANSWER

Kirksite bullet tests were made with rifles in excellent condition, from a bench rest, at standard NRA targets. Telescope sights were used when possible. Here they are, in part:

.257 Roberts, M70 Winchester sporting rifle.

Bullet: Hensley and Gibbs No. 5 (.257-92); weight in Kirksite, 55 grains with gas check. With 2400 powder, groups at 100 yards within two and one-half inches were with 10, 17, 19, and 20 grains. A 21 grain load showed a four-inch spread and at that point tests stopped with that powder.

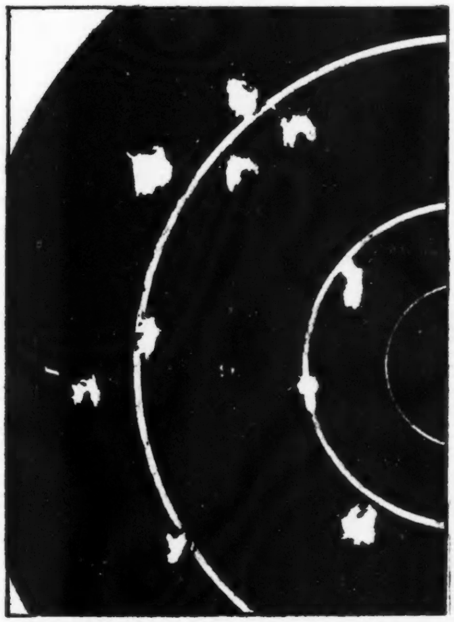
.257 Roberts on 1903 action with heavy Gebby barrel and target stock. Rifle equipped with 12-power scope.

Same loads were fired, with slightly better accuracy at all distances. Moreover, point of impact at 100 yards with the 20 grain load was the same as the 100 grain Barnes bullet at 3,000 feet per second. With sights set for 100 yards, the drop was four inches at 200 yards and about eighteen inches at 300 yards. You will note by the high trajectory beyond 200 yards that there is considerable loss of velocity at these greater distances. That load is fast, possibly 3,000 feet at the muzzle, but it is a short-range load. For purposes of comparison, the 87 grain bullet in .25 caliber at 3,000 feet, if sighted for 100 yards, lands 3¼ inches low at 200 and 12½ low at 300.

In this same match rifle the bullet produced two-inch groups at 100 yards with 28 grains of 4198, and I believe this is the best load we found in this caliber with these bullets. Tests for this rifle were made by Major L. S. Storrs, the owner of the rifle. In my own .257 sporter, excellent 100-yard groups were made with 16, 20, 24, and 28 grains of 4198, and with 17 grains of 4759. No. 4320 gave no evidence of accuracy.

.257 MVF Magnum.

If there ever was one, this is a cartridge designed for high speeds rather than light loads, so only two loads were tested with Kirksite bullets and they were not successful. However, to make the record of tests as complete as possible, here they are: The same bullet was used as in the .257 Roberts rifles. One load consisted of 40 grains of 4198 and the other of 30 grains of 2400. Groups were more than six inches and Kirksite tests were abandoned in this caliber. This gun just likes 4350 and heavy jacketed bullets better. It was so designed.



Hundred yard group, actual size, fired from author's .30-40 with 97 grain Kirksite bullet, and 35 grains of 4198. Bullets were cast in Kramer .311-161 mold

.303 British (Model 95 Winchester). Bullet: Cramer 311-161. Bullet weight in Kirksite, 97 grains.

Accuracy of this rifle, with the best iron sights, rest shooting with Mark VII ammunition reloaded with American components or factory loads, had been three inches at 100 yards. With Kirksite bullets and both 30 and 35 grains of 4198 and FA primers, I shot fairly consistent two- and- one-half inch groups at the same distance. Since the groove diameter of this barrel is .314 inch (Shame on you, Mrs. Winchester, for having so big a baby!), the .30 caliber bullets were left unsized and lubricated only with Ipco wads. I just can't believe that this fine old smoke-wagon could shoot so well, with any bullet. It just ain't so! And all these loads, with bullets sized, should be even better in your .30-40 Krag or Winchester.

.30-'06 National Match Springfield; Lyman 48 sight.

The same bullet was used as for the .303, but resized to .311 inch and lubricated with Ideal lubricant. In this instance I page 39-40 missing (index taken out)

had some help in determining velocities from Mr. F. C. Ness, who tried similar weight bullets cast in zinc, and reported the chronograph tests in Sharpe's "Complete Guide to Handloading." Since zinc and Kirksite weigh about the same (zinc is slightly heavier), those velocities may be assumed to be about correct in similar Kirksite loads.

All of the following .30-'06 groups were under two and one-half inches at 100 yards. Moreover, all of the hotter loads were higher on the target than the impact of 180 grain Western Silvertips. The fastest load grouped about three and one-half inches higher. Powder used was 4198. Loads were 24 grains at 2,050 feet; 30 grains at 2,380; and 40 grains at 2,920 feet. The last load was the best.

It seemed to me that these Kirksite bullets now should be tested in one of the older types of rifles, preferably of black-powder vintage, since so many of these rifles are still in use by ranchers and backwoodsmen, so I chose a .38-40 Model 92 Winchester, as typical of the black-powder and lead-bullet era. Here are the results:

The H. and G. mold for 180 grain lead bullets was chosen for this .38-40. Previously, when cast bullets of lead were fired, I had found that 18 grains of 2400 gave me far greater accuracy than any factory load or any other handload. Groups were just under four inches at 100 yards. The same mold cast Kirksite bullets weighing 109 grains. It shot a three-inch group, and I believe that because of the location of the group on top of the bullseye, velocity was a bit better than that of the lead bullet. I also tried 24 grains of this powder, but the group smeared out to five inches.

Well, that .38-40 has gone deer hunting (close range only) in the hands of a friend of mine. Tests also are to be made in some of the other calibers. But I think killing power is the second chapter in any discussion of new bullets. Kirksite, having passed its accuracy tests fairly well, has been deserving, I hope, of this, its first chapter.

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Ammunition for Foreign Rifles

(*Continued from page 35*)

.256 Mannlicher-Schöenauer bullets of American manufacture are available, they meet requirements for other rifles since Mauser .256 bores generally can use the same bullets. Similarly, all 7 mm. bores are substantially alike, and 7 mm. jacketed bullets are manufactured in this country. Nearly all the nominal 7.8, 7.9, 8, 8.1, and 8.15 mm. cartridges can be suited by either .32-40, .32 Special, or American 8 mm. bullets, with the single exception of those barrels of less than .319 inch-groove diameter. For these it is a little difficult to find jacketed bullets small enough, but by selecting from different makes it should be possible to find 8 mm. bullets within safe limits. With jacketed bullets, this safe limit is up to, but not exceeding, .001 inch over groove diameter. Good fortune in the matter of jacketed bullet supply extends even to the 9 mm., in which .35 WCF bullets can be used if American "9 mm. Mauser" bullets are hard to find.

Above 9 mm., cast bullets generally must be resorted to. In these larger calibers this does not impose too great a handicap in shooting game at least up to white-tail deer. The Ideal bullet mold series will be found to include bullets for all the foreign large bores with the single exception of the popular 9.3 mm. The groove diameter in this caliber averages .366 inch, which is not suited by anything available. The only quick solution is to paper-patch cast bullets for the .35 WCF to that diameter, which I find can be done very successfully. Otherwise, one could pay for a new bullet mold cherry, or swage .35 WCF or Remington jacketed bullets up to .366 inch diameter.

This brings us to the cartridge case, which is the real crux of foreign-caliber handloading. In the situation we now are considering, fired cartridge cases are available, but they are useless unless primers can be provided. The Berdan primers they use are practically unobtainable.

The simplest solution is to use a shotgun battery-cup primer. Knock the primer from a fired shotgun shell and you will see that it has the shape of a little blank cartridge. Metallic cartridge cases can be adapted to use it simply by drilling a hole through the head of the case to receive the body of the primer, and then counterboring to allow for the rim. This is illustrated in the left half of Figure 3. A lathe or drill press is very convenient for the operation, but it can be done adequately with a breast drill. While a rimmed case is illustrated, the method is equally suitable to rimless cases and to all calibers.

All modern battery-cup primers except those of Remington make are accommodated by a hole made with a "B" drill, and counterbored with an "O" or slightly larger drill to provide a seat for the rim of the primer. Remington primers are smaller, and require a No. 2 drill for the hole to receive the body, counterbored with not less than a 19/64-inch drill. The drill used in counterboring for either primer should be reground almost flat-ended, to produce a good seat for the primer rim.

The above works very well for many cartridges (it gave me perfect results in heavy black-powder loads for the .461 Gibbs) but involves some disadvantages. Like the low-pressure rifle primer, the metal of a shotgun primer is not heavy enough for high pressures. It also contains more priming composition than a rifle primer, and while that is not dangerous with the moderate charges recommended for such cases, overpriming does impair the uniformity of velocity. Most important, shotgun primers may be mercuric, which would be extremely undesirable since we want to save rare cartridge cases. An improved method, therefore, consists in replacing the shotgun primer with a .25 ACP cartridge case, in which high- or low-pressure small rifle primers are used as required. This method of assembly is shown in the right half of Figure 3. The .25 ACP case is not rimless but semirimmed, and is pressed tightly into the head of the rifle case in the same manner as the shotgun primer. The through and counterboring drill sizes are 9/32 inch and 5/16 inch respectively. The .25 case is not removed in reloading, and decapping is accomplished by using a punch small enough for the .25 case.

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In his concluding installment the author will discuss the more difficult means of providing ammunition for foreign arms —expanding or reshaping of existing American cases and, where necessary, lathe manufacture of new cases.

This Business of Head Space

(*Continued from page* 32)

"blown up" on the fourth shot, using a well-known make of factory-loaded extrahigh-power hunting cartridges. This he felt, was due to excess head space, which he had been reading so much about. I doubted that the rifle had "blown up," and moreover, the trouble sounded like a soft head or an expanded primer pocket, and not excess head space. I wrote and offered him a new Enfield for his old one if he would send it to me with the cartridge that had caused the trouble.

When the gun came in, it was in excellent shape, except that the extractor was blown off and the extractor collar bent. The offending cartridge was still stuck tightly in the chamber. It was a typical soft head, with the primer pocket expanded to about twice its normal size and ripped wide open on one side. After we drove out the remains of the cartridge and replaced the extractor and collar, the rifle appeared as good as new. The head space was then taken, and after all this hullabaloo it was found to be only 1.943, in spite of the fact that the rifle had been "blown up."

A few weeks ago Al Barr and I took this rifle to the range and reamed the head space out to 1.955, or fifteen thousandths above the normal minimum, and I sat down at the bench rest and fired five shots with 172 grain boattail M1 ammunition, getting an excellent group at 100 yards. We then reamed it to 1.960, and I fired ten shots, getting a considerably larger group, possibly due to the fact that Al was telling me all the time that I was taking a terrible chance. After these ten shots, the head space was again measured, and was found not to have changed at all. We then reamed it to 1.965, and I fired five more shots. The group was better, but not as good as the first one; but I don't put too much store by the group sizes, as we had to stop and chase some horses from behind the target, and moreover, we had to watch out for a couple of boys driving up the cows, and besides it was getting very dark anyhow. This last we regretted, because we wanted to go on increasing the head space until we began to get separated cases. We will do that next time.

Up to this figure of 1.965, or twenty-five thousandths over the normal minimum, we had got no reaction whatever, and the cases themselves showed only a very slight indication of stretching, and were nowhere near a rupture.

One caution, though. This was only one test, or rather, part of one. One lone test of a few shots will not even start to settle a question like this. However, I have had a lot of actual, personal experience with this head space matter. I was not afraid to sit down behind this gun with no protection except a good pair of Raybans and the knowledge that my pressures were not over 50,000 pounds and that I was using superb brass—F. A. National Match 1940. As additional protection, I had in my mind a pretty good picture of the signs of trouble as shown on the cases, each of which I looked at before firing the next.

The Ordnance Department, with all its years of accumulated knowledge and its wealth of actual experience and reports on millions of guns in the service, has set 1.950 as the point at which the guns are withdrawn from service for overhaul. That doesn't mean that 1.950 is the point where trouble *will* occur. They play it safe, and withdraw guns *long before* the actual trouble point. They purposely have a big factor of safety there, knowing that there may be long intervals between visits of the inspector.

And a further word of caution. Don't forget that there is another way in which the Ordnance Department, with its knowledge and experience, plays it safe. That is in the matter of pressures. They have always tried to keep the pressure of the service load at 50,000 pounds or *less*, knowing full well that brass is fickle as a woman, and cannot be depended upon over that figure. They would never allow such crazy pressures as are found in some of our popular souped-up loads, head space or no head space. So Brother, if you are going in for anything with higher pressure than the service loads, you had better keep head space and everything else *right*!

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I NEVER IN MY LIFE saw better rifles (or men who shot better) than those made in America: they are chiefly made in Lancaster, and two or three neighboring towns in that vicinity, in Pennsylvania. *The barrels weigh about six pounds two or three ounces, and carry a ball no larger than thirty-six to the pound;* at least I never saw one of a larger caliber, and I have seen many hundreds and hundreds . . . I will next tell you how they judge what quantity of powder is necessary for their rifles, on active service: for shooting deer, etc. in peaceable times, they never put in more powder than is contained in a woman's thimble. They take the horn of a deer, make several trials with a ball, always on the powder, and when, by each time increasing the quantity of powder, they find the rifle rather throws back, that is to say, has a recoiling motion, they draw off a small quantity of the powder, cut the horn off, and use it for actual service before an enemy. . . . I had a most excellent American rifle, which carried full one half of the weight of the ball of our best powder, without recoiling in the least. I must inform you also that their rifles are made with one whole spiral turn in the barrels, which are . . . three feet three inches long . . . Gentlemen, I can assure you, on my word, that the American riflemen have but *one sight behind* to their guns: I mean, by this, that they have no rising sight, by which to give their guns a greater degree of elevation; and *that one sight* is not above *two sixteenths of an inch* in height above the barrel. I do believe, that, if he shot at a man standing still, at four hundred yards, by only aiming at the man's head, that he would drop the ball into his breast, *not lower*, or go so near to him as to alarm him devilishly.

—Col. George Hangar, *To all Sportsmen, etc.*, London, 1814.

Shooting the Muzzle Loaders

(Continued from page 11)

False muzzle of "slug" rifle, with two-strip patch paper in place

These rifles are capable of excellent accuracy at ranges even beyond 220 yards, and many fine groups and scores have been fired with them in recent years. Nor is the secret of their manufacture dead. That has been proved in several instances in which present-day rifle makers have made their own slug guns and all of the necessary tools and equipment. These modern muzzle-loaders have been fired in matches with results as excellent as those of rifles by the old masters.

The last type of rifle to be discussed is the familiar "Kentucky" hunting rifle, which still has its place in modern offhand events. This was the famed rifle of our pioneer ancestors, and the rifle with which most newcomers to the muzzle-loading game make their start. The average weight of the "Kentucky" (which, incidentally, was born in the gunshops of eastern Pennsylvania) is about nine pounds, and the barrel length about forty inches. Calibers range from .32 to .45 in the late flintlock and through the percussion period. The distinctive drop of the stock present in most of these weapons averages from three and one-half to four inches. Much speculation has been wasted on explanations of this feature of design. My own opinion is that it was a style, followed through many years, simply because of the graceful beauty that it gave this remarkable weapon.

The deep, crescent butt plate has also come in for its share of speculation. Again, the explanation seems simple. With so much of the weight of the rifle in the long barrel, the crescent butt plate served the same purpose as the prongs of the old Schuetzen rifle—keeping the butt of the rifle from slipping on the shoulder or upper arm when aiming.

The stocks of these rifles are nearly always of curly maple, though some are made of walnut. Butt plates, patch boxes, trigger guards, and end piece of the stock at the muzzle are of brass, while the artistically designed inlays are frequently of silver. Double-set triggers are found on practically all of the rifles made during the late flintlock era, and all through the percussion period. These triggers were evidently a product of the gunsmith who made the rifles. The locks were sometimes made by the gunsmith, but more often they were purchased from English or American firms which specialized in their manufacture. Many of the barrels were also made in factories and supplied to the gunsmiths, who rifled them in accordance with their own ideas. Some marked the barrels with their names or initials. Others never did. Only rarely does the date of manufacture appear on one of these rifles. And like the other muzzle-loaders, no two are identical in shape or decoration.

The type of rifling found in these "Kentuckies" varies considerably. The grooves and lands range from six to eight. In some barrels the grooves are only half as wide as the lands. Others have lands and grooves of nearly equal width. They were often rifled very deeply, and frequently relieved slightly at the muzzle to simplify the loading of the ball in its patch. What they were capable of in accuracy in their original condition is a subject about which we know little. Nor have I been able to locate one of these rifles with the original bore in such condition that it could be tested for accuracy. It is always necessary to have these barrels either "freshed-out," rebored and rerifled, or relined, to put them once more in first-class shooting condition.

Some explanation is called for on these three methods of reconditioning barrels. In freshing-out an old bore, a tool is used which follows the original rifling, and cuts the lands and grooves down to clean metal through the length of the bore. The second method, much preferred over the first, is to have the gunsmith bore out all of the old rifling and then rerifle to either his or the customer's choice in the matter of number and width of lands and grooves, caliber, and pitch of rifling. This manner of restoring can be done only when there is sufficient thickness of the barrel walls to permit the necessary enlargement needed to remove all the metal damaged by corrosion.

A third method is by relining, which is the only method of putting some of these barrels in usable shape. If the rifling has at some time been bored out for the use of shot, as often happened, there is not enough metal left for rerifling, so the gunsmith solders a steel tube inside of the old barrel and reams it to the size desired. The tube is then rifled. Mr. Addicks relined a number of these light rifles for several friends and myself, and all of them have given very satisfactory accuracy.

It should be mentioned here that present-day gunsmiths do not enlarge the bore at the muzzle to facilitate loading, as was done in the old days, but instead use a cutter to *bevel* the bore slightly at the muzzle, so that in loading there is no danger of tearing the patch on the lands while seating the ball.

Offhand events with these lighter hunting arms are held at ranges of thirty to 100 yards. NMLRA rules require that the arm supporting the rifle be held away from the body, and only a very strong man can comfortably handle a rifle of over ten pounds. Rifles of from eight to nine pounds are about right for the average man, and the caliber should be from .40 to .45. In offhand matches at fifty or 100 yards, these calibers are more dependable in windy weather than the small squirrel rifles of .32 to .36 caliber.

Original examples of these lighter arms are far more common than are the heavy round ball and "slug" rifles, and fewer modern examples of them are seen than of the other types. However, some "old-time" gunmakers still make Kentucky type rifles, both percussion and flintlock, and the secrets of their manufacture are by no means a "lost art." ◆ ◆ ◆

In his concluding installment, the author will discuss loading methods for both round ball and slug rifles, and some of the finer points of accuracy with the muzzle loaders. In a final article, to be published in a forthcoming issue, Coble will complete the story of today's muzzle guns with a discussion of safety factors, types of sights, shooting positions, and the accuracy of round ball rifles at ranges up to 200 yards, along with a brief account of the more popular of today's muzzle loader tournaments. Together, the three articles will constitute an informative and thorough introduction to this "newest" of America's shooting sports.—ED.

The Old Coach

". . . THE STRENGTH OF THE WOLF IS THE PACK."

December is the time of year when we should check up on our activities of the past twelve months. It is the time to plan for the job ahead that will start with the New Year. And what has this to do with rifle shooting? Well, first off, every one of you fellows, old and young, should be a member of the National Rifle Association of America. The price of a box or two of ammunition will put you within the magic circle of riflemen who are proud to tell the world that they are riflemen, the men who are making rifle shooting the great sport that it is. At least, you should be a member of a rifle club—it should be an affiliated club—because being an affiliated member of the NRA is much better than being no member at all. And the main reason for being one "of the gang" is found in the lines of Kipling's poem, "The Law of the Jungle," which from memory run about like this:

> O this is the Law of the Jungle, as old and as true as the sky,
> And the Wolf that shall keep it shall prosper, but the Wolf that shall break it must die,
> As the creeper that girdles the tree trunk, the Law runneth forward and back—
> For the strength of the Pack is the Wolf, and the strength of the Wolf is the Pack.

As individuals, regardless how hard we try, little can be, or will be, accomplished. But as an organized unit, great good will result for all concerned. As riflemen we owe it to the shooting game; we owe it to ourselves; we owe it to the potential strength of the Nation. Those who do not belong to the NRA or to an affiliated club render, on the whole, little to the cause. On the other hand, they ride free, as we say, and benefit at the expense and effort of the fellows who wear the "pin." In fact, were it not for the NRA and its affiliates, these rod-huggers would be playing marbles, since it is quite certain that the antigun sisters would have taken firearms away from the people years ago.

Well now, what has your club to report for 1946? I know of one club out in Colorado that, on top of its regular seasonal series of matches, open to all comers by the way, put its range at the disposal of the deer hunters of the area who wished to sight in their rifles and get a little practice just before the opening of deer season. Two Sundays were given over to this splendid activity. In addition to the 150 or so hunters who were cared for on these two specified days, others were assisted by club members as a strictly individual service. The result was: Around 200 nonmember potential riflemen were shown the road to better rifle shooting. Many of these men came with new, unfired rifles; many had sights badly set or mounted. The club charged a fee of one dollar, and the best and most skilled members controlled the portholes and sighted in, or assisted in sighting in, the rifles.

One angle too many rifle and pistol clubs apparently overlooked is the duty such a club owes to the community. It is one thing for a club to keep all its fun, all its arms and ammunition, selfishly to itself. But it is something else of a far higher order when such a club not only develops its own membership, but at the same time spreads out its goodness to the nonmember rifle shooters of the community. It is hard for a selfish club to vindicate its existence. For instance, what real good is being done the Nation by ammunition, scarce now and maybe for a long time to come, that is used solely by selfish, unthinking members of a club? On the other hand, there is the club that not only looks after its own members, as it most certainly should, and first, but also holds shoots open to all comers, making a real effort to get nonmembers to do some of the shooting. Such a club is definitely an asset to the community and the Nation. Such a club will increase interest in rifle shooting; it will gain new members. Such a club will get a municipal indoor range included in the town's plans for a new community center, a thing taking place right now at Loveland, Colorado.

What's the reason your club can't hold a good old-style turkey shoot, open to everyone? Any rifles and any sights local conditions will permit. Never mind the weather, providing, of course, it isn't storming. But plan a real Yuletide lead-slinging contest. Give it plenty of advance publicity. Have safety rules posted on the range and insist, in a nice way, that they be observed. Such a shoot can be held indoors, if needs be, but take a little snow, a fairly mild December day, a bottomless pot of hot coffee, and an unlimited supply of sugar doughnuts and pumpkin pie—O, Boy, O, Boy! You think such a shoot won't bring out a crowd? Did you ever try it? Shoot at the old-style muzzle-loader's cross on a board. Shoot at plaster of paris turkey heads or ditto dollar-size discs at 100 yards; how the folks love to see the pieces fly when the bullet connects. Let 'em shoot prone, rest, sitting, any old way that is safe and sane. Have a pistol range, also a corner where the shotgun boys can shoot at cards and then count the number of shot holes for score. If you have a trap and clay birds, better yet. Provide a side range with rest where the visitors can sight in. You club members will run the shoot and the visitors will do the shooting. This is your big show for the home-town folks—from the Mayor down. Be sure to plan for the women and the little fellows. They will all want to take a crack at the target, whatever it is. In planning the shoot, be sure to make your cost estimate high enough to cover the whole show. Don't try to make money; break even or a little better. For prizes have turkeys, geese, fat hens, a thick steak, some Kiska Moose (Spam—ask the boys who know), merchandise items, or anything else. The big thing is to put on the shoot; local conditions will decide these details. Let Sam Hittem show how it is done at plaster discs with his Winchester autoloader. Some fancy pistol shooting takes well. Give your club a boost. Give the sob sisters an eyeful. Think of the headlines—"Mayor Wins Fat Hen." "Mrs. Smith takes Pistol Prize." It can be done. It is done. You and your club can do it. Go to it, Rifleman, and Merry Christmas.

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POWDER SMOKE: THE NEWS DESK . . . READERS COMMENTS

COLLEGE COMPETITIVE PROGRAM REVIVED

During the 1946-'47 school year the NRA will resume collegiate rifle and pistol activities last conducted in 1941-'42. Approximately one hundred college rifle and pistol clubs will participate this year in the Association's Gallery League Series as well as in the Intercollegiate qualification and match events. The college season will be climaxed by the National Intercollegiate Rifle and Pistol Championships, both team and individual, to be fired in sectional shoulder-to-shoulder tournaments next spring.

The selection of the ten All-American team members to receive the Golden Bullet awards will be made for the first time since before the war.

Detailed information on the entire collegiate program can be obtained on request from the NRA Club Activities Division.

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CLUBS ORGANIZE IN READING

Pennsylvania shooters in the city of Reading and Berks County have organized the Federation of Berks County Shooting Clubs. The Federation will further the shooting game in the entire area, with the securing of a municipal indoor rifle and pistol range its immediate objective. Several thousand NRA club members will be represented in this new organization, which will undoubtedly carry considerable weight with local politicos. Malcolm H. Bohn is temporary President of the Federation.

ANOTHER NRA SERVICE

At the turn of the year the NRA announced a new optional service available to members—the opportunity to purchase broad accident insurance protection in one of the nation's old reliable companies at minimum cost. Many members, recognizing the value of such protection, have purchased the new policy.

Already seven members have had doctors' bills paid for accidents at home, in automobiles, while working, and outdoors. One, in Michigan, stepped in a hole while hiking and dislocated his knee; his $266 bill for medical treatment was covered by his policy. Another dislocated his arm while driving and his $65 doctor bill was paid by his accident insurance policy.

Any NRA member interested in this new service may obtain detailed information from the Association on request. A similar plan covering "all risk" insurance on the guns and shooting equipment owned by members has been in effect for several years. Members desiring to protect their investment in firearms should ask for the circular "All Risk Gun Insurance."

GALLERY LEAGUE SEASON OPENS

During the winter and early spring clubs depend on gallery shooting to provide competition for their members. In nearly all communities the gallery league is the form of competitive shooting that offers the most excitement and enjoyment to the individual shooter and club members.

Judging from the number of leagues that participated in summer league competition and the way entries are coming in at present, we believe this year's National Gallery League Championship is going to be the largest of its kind ever.

The NRA Gallery League Championship offers all leagues an opportunity to fire in a nationwide program in which all have a chance to win national shooting honors, plus trophies and medals awarded by the National Rifle Association.

If your club has not formed a league of its own or entered one or more teams in a local league, now is the time to do so. In the event your club has formed a league, or has a team in one, that is not entered in the National Gallery League Championship, you have until December 15 to make your entry. All club secretaries are being mailed suggested league conditions and blanks for registration in the National Gallery League Championship. The winning team in your league will fire in State and National Championship finals conducted shoulder-to-shoulder wherever possible.

Leagues may shoot over courses of fire and be governed by match conditions decided upon by league members and officials. However, conditions and courses of fire in the State and National Championship Matches will be established by the NRA, so that all teams will be competing on an equal basis.

Many clubs are getting the maximum enjoyment from league firing by forming a league within their club and also entering a team in a local league in which several clubs compete.

BOOK REVIEWS

FOUR REPRINTS

Herman Dean, whose Standard Publications, Inc., has been catering to shooters for a number of years, has just released four "new" titles—facsimile reprints of nineteenth century shooting books. Though interest will probably be limited, due to the character of the books themselves, the idea is a commendable one. All four are practically unobtainable, and three, at least, include material of some interest to the growing ranks of muzzle-loader fans.

Ezekiel Baker's, "Remarks on Rifle Guns," originally published in London in 1835, has long been known to shooters—as much for its fine hand-colored engravings as for the merits of its text. It is a shame that the lithographic process used in reproducing the book reduces these plates to flat blacks and greys. Aside from this, the book is interesting as a contemporary manual of handling the muzzle-loading rifle, albeit the English, and not the American variety. In Deane's, "Manual of Firearms," the reader will find a similar volume, but written thirteen years later (1858). There is a long historical retrospect and chapters on construction and use of firearms of the period. Altogether, this new edition of Deane will be largely of academic interest to modern powder burners, but of considerable value to the occasional researcher into the firearms of the mid-Nineteenth Century.

The two other titles are Clephan's, "Outline of the History and Development of Hand Firearms," which covers in well documented form those primitive firearms prior to the Sixteenth Century, and Bosworth's, "Treatise on the Rifle, Musket, Pistol and Fowling Piece," originally published just 100 years ago. The author devotes the first part of the book to an elementary discussion of the laws of falling bodies as affecting the flight of projectiles, followed by a discussion of mirage or, as he calls it, refraction. There are some pointed recommendations on the relative suitability of various kinds of iron, brass, etc., for use in casting gun barrels. The book ends with a discussion of the accuracy of smooth bore guns, pistols and fowling pieces. It makes interesting reading for anyone wanting to know how shooters were thinking 100 years ago.—J. S. H. and J. K. S.

(Ezekiel Baker, *Remarks on Rifle Guns* (1835), 268 pages, illus., $6.00.)

(Deane's, *Manual of the History and Science of Firearms* (1858), 286 pages, illus., $6.00.)

(R. C. Clephan, *An Outline of the History and Development of Hand Firearms, From the Earliest Period to About the End of the Fifteenth Century* (1906), 66 pages, illus., $3.00.)

(Bosworth, *A Treatise on the Rifle, Musket, Pistol and Fowling Piece* (1846), 113 pages, illus., $4.00.)

All published by Standard Publications, Inc., Huntington, West Virginia.

(Standard Publications has called to our attention an error in the price of Lenz' *Rifleman's Progress*, reviewed in the November issue. The price is $8.00, not $10.00.—Ed.

NEW BOOKS FROM DENMARK

Gradually, publishers in the occupied countries of Europe are starting up again, and new titles are already reaching the U. S. Of considerable interest to the old gun collector are the monographs on ancient arms published by the Tøjhusmuseet, or Royal Armory, of Copenhagen, Denmark. Their major publication to date is the huge two volume dictionary of gunmakers *(Handskydevaabens Bedømmelse)* of Johann Støckel. Volume one includes entries on approximately 7500 arms makers; the second volume covers gunmakers marks, identified and unidentified—a total of more than 6,000. Although written in Danish, language difficulties are minimized by the dictionary character of the work, and by the intelligent inclusion of English glossaries of most of the words used. The work stands alone in its field, as the only thorough treatment of the subject, and will be invaluable to collectors of ancient European arms. The entries on American makers are fragmentary, but this field has already been adequately covered in Gluckman and Satterlee's, "American Gun Makers."

The Tøjhusmuseet has also published volumes 1-4 of another series devoted to ancient arms— the *'Tøjhusmuseets Skrifter.'* Again the authorities of the Tøjhusmuseet have displayed unusual vision in publishing these monographs in the language of the country to which their subject matter most pertains. The four numbers now available are on the swordmaker Gottfried Leygebe (in German), notes on the development of the glaive (in English), Nineteenth Century machine guns (in Danish), and a monograph (in English) on the Danish revolver inventor, Rasmussen, a contemporary of Samuel Colt.

It is difficult to quote prices, due to fluctuations of European currencies, but prices in Danish kroner (which may be remitted by bank draft) may be had by writing the Director, Tøjhusmuseet, Frederiksholms Canal 29, København, Denmark.—J. K. S.

A VOLUNTEER'S ADVENTURE

By John William DeForest

Rifleman readers will find this book very interesting. It is a realistic account, by a novelist, of service with a regiment of Connecticut volunteers in Louisiana and later the Shenandoah Valley during the Civil War. The chapters on the siege of Port Hudson on the lower Mississippi and Sheridan's victory at Opequon are excellent accounts of actual combat.

The incident of the soldier being forced to remove his blanket from a bush during the siege of Port Hudson, because it was being hit from about 800 yards away is one of several examples of accurate marksmanship mentioned in this book.—J. A. H.

(Published by the Yale University Press, $3.00.)

PROTECT YOUR HOME FROM
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CHRISTMAS·SEALS

STOLEN GUNS

Cased pair of percussion target pistols, single shot, long octagonal barrels stamped "C. Slotterbek, Lakeport, Cal.," new condition. Reward. Stolen from G. H. Smoots, 624 Foster Avenue, Coeur D'Alene, Idaho.

One new .22 H&R revolver, #5849Z, double action. Stolen from Finnie B. Terry, Big Pine, Calif. Reward.

Winchester M94 .30 caliber, sporting carbine #1300007. E. C. Poer, Jr., 1046 Haight St., San Francisco, Calif.

Double-barrel hammerless shotgun, #14371, stock broken. Stolen from H. J. Hussey, Kirkwood Bros., 23 Elm St., Boston 8, Mass. $100 reward for return or information leading to recovery.

One American Eagle Luger pistol, .30 caliber (7.65 mm.), grips initialed "L.H.," extractor slot milled for over-size spring. Leslie M. Hart, 623 Oak St., Rockford, Ill. Reward.

One U. S. .30 cal. M1917 rifle, #394136. Stock altered, guards filed from front sight, otherwise as issued. One German 7.9 mm. cal. rifle, #6232, Spandau barrel, Bishop stock, otherwise as issued. R. Clark Neilson, 824 First Ave., Salt Lake City, Utah.

Winchester 1890 .30 cal. (W.C.F.) carbine, #222064. Poor condition. P. H. Dennis, Saugus, California, Rt. 3, Box 92-A.

One .22 cal. Colt Woodsman, #97442. Richard K. Dickinson, 705 Irving Ave., Syracuse, N. Y.

The SPOTTING SCOPE

With RAY STANN

The shooters of America can look for the opportunity soon to voice their opinions on the programs of the future. . . . The NRA is now appointing committees of representative member shooters, club and tournament officials to study recommendations for possible changes in existing courses of fire, rules, statistical procedures, etc. . . . In addition, questionnaires will be circulated among members to provide a sounding board for the committees, once discussions begin. . . . Meanwhile, we'll welcome any and all suggestions from you.

☆ ☆ ☆

Wear your glasses in the hunting field, The American Optometric Association suggests, in making the following recommendations to prevent collection of rain, snow, or steam on lenses: Rub soap on inside and outside surfaces and polish with a dry cloth. . . . Their figures indicate that if 14 million men get hunting licenses this year (as predicted), there will be 280,000 who are color blind in the field . . . pointing up the need for increased ability to distinguish fine details, not dependence on colorful garb as a prime safety factor. . . . Here's proof from a news clipping:

In California, Earl Reynolds was watching for a buck he had just spotted when a bullet zinged through his hat. "I knew that if I moved, whoever shot at me would keep shooting so I fell behind a log," he related. "The fellow ran toward me yelling, 'I got him; I got him.'

"I didn't say anything until he crawled over the log when I stuck my .30-30 into his belly, took away his gun, and broke it over a log. Then I worked on him with my fists. One thing's certain; he won't be able to hunt the rest of the season and next time he'll look to see what he's shooting at." 'Twas truly justice.

☆ ☆ ☆

For members in the far Southwest: A new NRA Field Office and representative will be announced this month . . . better service for members in southern California, New Mexico, Arizona, western Texas and adjacent areas. . . . The new representative will be popular Lee Echols, formerly of the U. S. Treasury Border Patrol

☆ ☆ ☆

Ancient History Department. Fifty years ago this month (December, 1896), the shooters of America were being polled on a possible replacement target for the Standard American and German Ring targets for 200 yard shooting. . . . The result: Those two targets, in most common usage at the time, picked up more than two-thirds of the votes cast.

Twenty-five years ago this month (December, 1921,) the U. S. was declared victor in the Dewar Trophy Match, outscoring Britain and Canada in that order . . . exactly the order of finish in 1946. . . . But look at the winning scores: 7735 for the U. S. in 1921 for a 20-man team average of 386.75, as compared to 7949 this year for an average of more than 397 per man.

RICOCHETS

TEDDY'S VIEW

Haddonfield, N. J.

Editor:

You might be interested in the following paragraph which appeared in *The Outing Magazine*, November, 1907.

"Every citizen should be an active supporter of the Rifle Association, and of the civilian rifle clubs; both the discipline and the knowledge he acquires are invaluable. President Roosevelt said the other day that he believed it to be most desirable for every man of this America to qualify himself so as to be able to do his own voting and his own fighting; putting his theory into practice, as usually he does, the first thing he did on being graduated from Harvard, was to join a political club, and the second thing was to join the National Guard. A worthy example. . . ."

Theodore Roosevelt, not F. D. R., is the president mentioned.

Harald D. Eriksson.

ITALIAN CARCANO

Bethesda, Maryland.

Editor:

Regarding the Italian Carcano (Ariska Ancestry, Page 27 of the November Rifleman) let me point out a dangerous weak point in the Carcano that was brought to my attention by a letter from Mr. Russel J. E. Caplain of Pottsville, Pa., in *Hunting and Fishing* for April, 1946. Mr. Caplain explains how a RAF soldier was killed by an Italian carbine when the firing pin assembly blew back in his face. A very small lug is all that holds the safety and firing pin assembly inside the bolt, and only a small vent is provided near the front end of the bolt for relieving pressure from pierced primers. In this case, when the gun was examined, the bolt sleeve was all right, but the primer pocket was enlarged and evidently the pressure leaking through the firing pin hole had sheared off the small lug holding the assembly inside the bolt.

I have a rifle from Japan which has a bolt with the firing pin and safety assembly identical with the Carcano, and, of course, the same warning applies to it. Perhaps it is rare, as it is the only one I have seen or heard of. The handle and the ejector groove are located differently on the two bolt sleeves, so that they are not readily interchangeable.

Before firing my Carcano, I did two things which should make it fairly safe to shoot. The bolt and parts are casehardened, and the lug holding the firing pin assembly in is so small that this hardening could make it very easy to snap off from a sudden shock. I removed the safety sleeve having the lug on it and heated it over a gas flame until it became blue from heating, dipping it in hot motor oil occasionally to insure even temperature and prevent local overheating. For the second precaution, a Handee tool was used to grind a generous-sized escape vent in the bolt sleeve. This hole is on the left side when the bolt is closed and a place was ground on the receiver to permit the gas to escape. For this, a hole could be drilled in this receiver in line with the hole in the bolt, as the receiver is not hard. The bolt partially inserted in the action shows the size of the vent provided originally. The small size of the lug on the safety sleeve can be seen on the unassembled bolt.

The Italian carbines I have seen have a barrel length of about 17⅝ inches, which is nearly the same as the 17¾ inches for the barrels of the M1 carbines that I have measured. It is my understanding that the War Department changed its technical manuals (Basic Field Manual 23-7) from 17.75 (in 1942) to 18 inches (1944) for the length of its carbine barrels, and has asked the Alcohol Tax Unit of the Bureau of Internal Revenue not to register any M1 carbines, but to consider their barrel length as 18 inches, since the present specification is 18 inches. I think the Italian carbine should be considered as having an 18-inch barrel also. However, when I contacted the Alcohol Tax Unit with regard to whether they should be registered, I was referred to Section 2733 (a) of the National Firearms Act, which reads:

> "(a) Firearm.—The term 'firearm' means a shotgun or rifle having a barrel of less than eighteen inches in length, or any other weapon except a pistol or revolver, from which a shot is discharged by an explosive if such weapon is capable of being concealed on the person, or a machine gun, and includes a muffler or silencer for any firearm whether or not such firearm is included within the foregoing definition, but does not include any rifle which is within the foregoing provisions solely by reason of the length of its barrel if the caliber of such rifle is .22 or smaller and if its barrel is sixteen inches or more in length."

Hence, the present government policy seems to be that the Italian carbine should be registered. There are probably a few thousands in this country not registered yet, as most owners do not realize the barrel length is between 17½ and 18 inches. According to Alcohol Tax Unit circular 831 they will not be made unserviceable when registered, since they have bolt actions.

Hobart S. White.

CORRECT FORMULAE

Urbana, Illinois.

Editor:

I am somewhat chagrined that six errors are to be found in my article "Evaluating Shot-Shell Patterns" in the October Rifleman. Three of these I assume the responsibility for because I did not read the final draft of the manuscript, the other three errors are probably due to the fact that the printer is not accustomed to setting up equations.

On Page 26, the first column, the equation should read: Percentage Pattern=

$$\frac{\text{number of shot inside 30-inch circle}}{\text{number of shot contained in shot-shell}} \times 100$$

In the article the multiplier 100 has been placed in the denominator rather than in the numerator, which causes the decimal point to be displaced four places to the left.

The equation in the first column on Page 27 should read:

$$\frac{\text{Pi} \times (30)^2}{4} = \frac{900\ \text{Pi}}{4} = 225\ \text{Pi square inches}$$

As the equation now stands it would be equal to zero.

The equation on Page 29, column 2, should read:

$$\frac{\text{average number areas with pellets}}{\text{total number of areas in pattern}} \times 100$$

Page 30, first column, the last three equations should read:

$$\text{Shot A.}\ \left\{\frac{218}{304} + \frac{134}{225}\right\} \times \frac{100}{2} = 65.6$$

$$\text{Shot B.}\ \left\{\frac{201}{292} + \frac{128}{225}\right\} \times \frac{100}{2} = 62.9$$

$$\text{Shot C.}\ \left\{\frac{199}{172} + \frac{121}{225}\right\} \times \frac{100}{2} = 62.4$$

It was intended that the index would be an average of the average number of pellets per pattern, plus the average number of areas containing pellets per pattern, therefore, the number 2 will have to appear in the denominator of each equation. As the equations now stand the index numbers are half what would be calculated. I should also like to point out that the index number for Shot B in these equations should be 62.9 instead of 63.9.

H. L. Walker.

NOT FOR SALE

Carmichaels, Pennsylvania.

Editor:

In "Rifleman's Holiday" (October), you state, "The thirty-nine-year-old auto repairman borrowed a gun from his friend, Bob Gideon . . . *Gideon was disgusted with it, wanted to sell it and quit the shooting game.*"

I loaned this gun to my friend, but it was in perfect working order. I *never* was disgusted with it, *nor* felt that I would sell it for love or money! Furthermore, I would *not* have loaned the gun to my friend Moore had I felt the gun was inferior in any way.

Bob Gideon.

HUNTING AND WOODCRAFT

Lowell, Oregon.

Editor:

To any one who claims to be or aspires to be a big-game hunter the articles by Hosea Sarber and Francis Sell in the October issue are well worth reading several times.

So many hunters, after killing perhaps a dozen head, seem to think that automatically boosts them up into the expert class and they proceed to air their wrong conclusions in the pages of their favorite sporting magazine.

Fifty years ago when I had killed less than a dozen head of deer I imagined myself a finished hunter. But after all the elapsed time, spent in the mountains and desert, I have learned to use what skill and knowledge the long years have taught me instead of doing so much leg work. Still I make plenty of mistakes. One does not learn it all by a Hell of a lot.

A very small percentage of us will never hunt the Alaska big game but Mr. Sarber's conclusions regarding calibers and bullets may be equally applied to deer and black bear. A bear is not much harder to kill than a deer, although they are more hot blooded and their blood coagulates faster since the long fur may be carried in with the bullet, impeding penetration and catching blood drip.

Years ago I learned that a shot animal died from two causes, from shock caused by shattering of his nervous system, or from loss of blood. A bullet must be well placed to shatter a vital part of an animal's nervous system so we must rely more on a penetrating tissue-destroying blood-letting bullet, preferably one which passes clear through and permits free bleeding. The lightweight high-velocity bullets, while carrying shocking power, go to pieces because they lack penetration power.

As one's skill increases the power of his rifle may decrease. I have known exceptional hunters who found the common .22 adequate for elk. Of course this calls for fine stalking, accurate placing of bullets in the heart or lungs, and skillful tracking after half an hour or more elapsed time.

For years I kept two deer rifles, a .25-20 and a .30-'06, and killed more deer with the .25-20 than with the larger rifle, principally because it was light and handy and I carried it more. Incidentally I killed the largest blacktail buck ever known in this locality with one shot from the little rifle. My method of hunting depended on which rifle I was carrying. With the smaller I hunted the brush where the shots were usually within 60 yards. With the larger one I would travel one hillside and get my shots on the opposite one. However the fact remains that any game killed with the .25-20 could have been killed with the .30-'06 while the opposite was not true. Also as I am slipping and losing my skill I find that it takes a .30-30 to do what a .25-20 used to.

As to Mr. Sell's article on woodcraft and still hunting I find nothing to criticize, much to praise, and very little to add. Mr. Sell lives within a hundred miles of my hangout for the past 20 years, and our still hunting grounds are similar.

I might say that it usually pays to locate the area the buck you want is using and concentrate on him. If he leads you where the chances are all in his favor, leave him alone. Tomorrow is another day and conditions may be different. A good hunter should kill him or haze him out of the country in a couple of days.

Always investigate the results of your shots, even if they are apparent misses. It's always interesting to see where your bullets went and much game may be recovered which would otherwise be lost.

Here in Oregon and probably all other game-producing states it is sickening to see how much game is lost. I honestly believe there are as many or more deer left to rot in the woods as are brought out by hunters. Part of this loss is caused by the shoot-first look-for-horns-later guys. Also if one uses bullets that carry through and leave a blood track, much of this loss can be averted, since the crimson on the leaves clearly shows the difference between a hit and a miss.

Watch the wind constantly and pay attention to the other noises in the woods. The scolding of a jay bird, the smock of a chipmunk, or the chattering of a grey or piny squirrel has gained me many a shot and probably lost me many more since the animals are as wise to the way of the woods as I am.

Lastly keep the October issue of the RIFLEMAN on file and read these two articles several times this winter. The pay-off may come next hunting season.

J. N. SMITHSON.

The JUNIOR MARKSMAN

TWENTY YEARS OF PROGRESS

Nineteen forty-six is not only the NRA's Diamond Jubilee but also the twentieth anniversary of the NRA's Junior marksmanship program. It was just twenty years ago that the Association took over the operation of what had been the Winchester Junior Rifle Corps.

Progress has been steady during these years, and almost continuously upwards. The immediate goal a few years ago was 1000 year-round junior clubs. Now sights must be set higher. By year's end there will be well over 1200 junior clubs, in addition to 586 summer camps, participating in the NRA Junior program.

All junior activities have made similar strides. A few years ago, when only postal matches were conducted, a hundred teams in a junior match meant a good year. This year's postal team matches have 157 teams firing over the prone-standing course of fire in the Open Team event. Some 250 other teams are competing over an all prone course in the Scholastic, Cub (under fifteen years of age), and Girls' Divisions. This is far larger than any previous list of entries in similar matches.

During the summer season 213 camp teams and 474 individual campers fired in postal matches conducted especially for summer camp riflemen. This is the first time that individual matches were conducted for these shooters.

In the spring of 1946 the Association instituted a new type of Junior match. One hundred thirty-one teams and over 600 individuals fired shoulder-to-shoulder in eighteen strategically located sectional tournaments for scholastic team and individual honors. This was the first large shoulder-to-shoulder junior competition ever conducted by the Association. This gallery season will see that match greatly expanded. Not only school teams but all junior affiliated units will be eligible to participate. It is estimated that about 500 teams and 3000 individuals will take part. New trophies and awards have been designed for this event, which will be the largest of its kind ever conducted.

A main objective of the NRA junior program has been to teach as many youngsters as possible not only the efficient but the safe handling of firearms. During these twenty years more than a million and a half teen-age boys and girls have earned one or more NRA qualification awards. Whereas a few years ago clubs were scattered sparsely throughout the country, nearly every sizeable town is now represented by a chartered group. Approximately one half of them represent secondary schools but there are over 100 Boy Scout clubs. Others represent YMCA's, municipal boys' clubs, and similar organizations. Recently the Civil Air Patrol and VFW have instituted intensive programs to train their junior units in safe and proper handling of guns.

An interesting development is the increased interest in junior rifle training shown by local law enforcement bodies, municipal governments, recreation departments, and governmental youth development groups. Several score junior rifle clubs have been organized under this type of sponsorship and the number is increasing rapidly. A notable example is in Los Angeles where the local auxiliary police units now have thirteen NRA chartered junior rifle clubs in operation.

So much for the past. What will the future hold? We vision a junior rifle club in virtually every secondary school in the United States. We are looking forward to a junior competitive program, largely shoulder-to-shoulder, which will begin with league firing from late fall until early spring and culminate in the firing of shoulder-to-shoulder National championships. We are looking forward to a National junior competition with an American Junior Team traveling abroad to fire against the best young riflemen other countries can assemble. These are a few of the things for the foreseeable future. Other developments equally promising will undoubtedly be a part of the future NRA Junior program.

COMING EVENTS

DECEMBER

Nov. 30-Dec. 1, New York (C)—Long Island Gallery Championship, at Brooklyn. A. H. Chasick, 1296 Sheridan Avenue, Bronx.

1, California (Unregistered)—Oakland Monthly Pistol Tournament. John H. Valerga, Jr., 3800 Cerrito Avenue, Oakland.

1, California (Unregistered) — Southland Pistol Matches. R. S. Pease, Route #3, Box 84, San Diego.

7-8, Idaho (C)—First Annual Magic Valley Small-bore Gallery Tournament. J. W. Sidwall, 833 Shoshone Street, Twin Falls.

8, D. C. (C)—National Cap. Gallery Pistol Tournament, at Washington, D. C. T. G. Arnold, 5308 41st Place, Hyattsville, Md.

15, New York (C)—Met. Rifle League Gallery Tournament. Eleanor Dunn, 2922 Concourse, New York 28.

15, California (C)—San Francisco Police Monthly Pistol, at Lake Merced. Arthur P. Markgraf, 767-27th Ave., San Francisco.

15, New York (C)—Second Winter Gallery Rifle Tournament, at New York City. Wm. J. Baldwin, 10 Ashdale Rd., Larchmont.

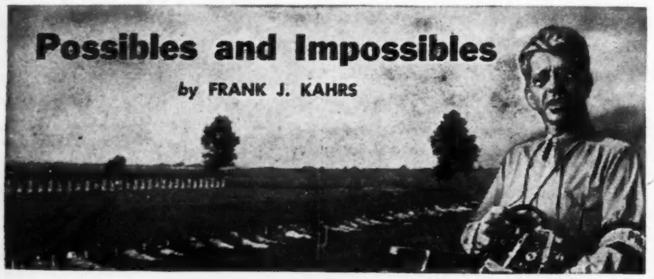
29, California (C)—77th St. Division Gun Club. A. S. Eppstein, 903 West 66th Street, Los Angeles 44.

A PAPER FOR PEOPLE WHO SHOOT

Rifle Re

VOL. 9, NO. 12

BRIDGEPORT, C



Possibles and Impossibles

by FRANK J. KAHRS

Following my annual custom, I wish to make my report for the year just passed to the readers of the column, constituting as they do thousands of friends everywhere. It isn't possible to send each a greeting, so we take this means of reaching out our old right hand of fellowship and friendship.

It has been a good year, as the last few years have been, with the promise always that next year will be better. So far as competitive rifle shooting is concerned, it was a good year, considering always that there is still a scarcity of guns and ammunition, and that things generally are not back to normal by any means. Until practically the middle of the year, there was hardly any ammunition at all, and it is a wonder to me that any shoots were held, but as soon as some darn good ammunition came rolling off the machines, competitive shooting came into its own, and even after Camp Perry, which was something like its old self in attendance, we saw several big shoots, one of which in late September had an attendance of nearly 200 shooters. That's a good sign.

So far as the future is concerned, we have no fears and we expect there will be many changes for the better, and in saying this we have in mind needed reforms in our system of range equipment and procedure, the running of matches—inside and out—and all that sort of thing. There is much to be done in this direction and those whose responsibility it is to see that it is done are on the alert.

Yes, we look for great things next year. And this brings us to the annual wish to all for a Merry Christmas and a Happy and Prosperous New Year! And also we leave with you the best wish of all: "Peace on Earth, Good Will Toward Men."

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Remington Model 513T Target Grade 22 has every desirable feature for match shooting!

Targetmaster, Pal

Re gton News

IDGEPORT, CO T, DECEMBER, 1946

First Class Reading Matter for Rifle Shooters

Merry Christmas!

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Remington Express
EXTRA LONG RANGE
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If he's a Hunter,

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Rich appearance of the Remington Sportsman autoloading shotgun is combined with extraordinary handling qualities.

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This most wanted target rifle is a princely gift for any small bore target shooter!

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TOURNAMENT REVIEWS

Mrs. Neva Seagly, Topeka, Ind., winner of the Remington Trophy Match at Perry this year, scored 1580-85x to emerge victorious from the Anderson Rifle and Pistol Club's "Post-Perry" Small-bore Tournament, held in Anderson, Indiana, September 29. Harry Showalter, New Castle, Ind., was second with 1587-67x. Individual match winners were: 50-yard any, O. E. Crockett, Elkhart, Ind., 399-27x; 50 meters, Richard S. Brown, Twelve Mile, Ind., 395-28x; 100-yard iron, Showalter, 397-19x; Dewar, E. E. Stout, 398-24x.

☆ ☆ ☆

Stuart N. White, Woodstock, Vt., won possession of the Bausch & Lomb Trophy for the Vermont-Dewar Championship, fired in the Vermont Rifle Tournament, Springfield, Vt., on August 25. White took first in the metallic-sight Dewar, 397-14x, and second in the any-sight Dewar, 400-28x, for 797-42x and the championship. John Hollar, Bellows Fall, Vt., scored 792-39x for second.

☆ ☆ ☆

Expert Charles H. Ziegler, Freeland, Md., was winner of the Stemmers Run Rifle Tournament in Stemmers Run, Md., September 8, scoring 1190-59x without once placing in open or class competition. Runner-up John E. Ruppert, a Sharpshooter from Baltimore, scored 1189-72x. Third place Cornelius Green, Chester, Pa., scored 400-32x to win the 50-yard match; Charles H. Sherrod, Hyattsville, Md., won the 100-yard event with 400-24x; and Fred C. Hampton, Baltimore, Md., was high in the Dewar, 397-24x.

☆ ☆ ☆

The aggregate of the Great Lakes Steel Annual Rifle Tournament, Wyandotte, Mich., September 15, went to the 795 tallied by Ferdinand Schimmel, Detroit, Mich. Two points behind was Frank Trezise, Royal Oak, Mich.

The Detroit Gun Club won the Great Lakes Steel four-man team trophy, 1582 over the Great Lakes Steel Gun Club's 1581.

☆ ☆ ☆

Dr. Horace J. Brown, Jr., Hollywood, Calif., won only one of twelve individual matches but totaled the high aggregate score of 2539, in the first annual Western States Pistol Championship Matches, September 20, 21, and 22, in Los Angeles. Brown's individual win was in the .45 caliber slow-fire event. Norman Adair was second in the aggregate with 2537; third with 2522 was Basil Starkey.

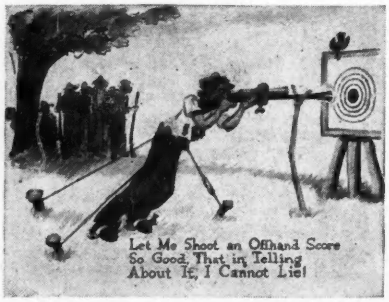
☆ ☆ ☆

E. L. Prins of Holland, Mich., won the grand aggregate of the Peach Harvest Small-bore Tournament in St. Joseph, Mich., on September 15, and scored the first possible ever recorded on the St. Joseph range, 400-28x in the fifty-meter event. Everett Brownsey, LaPorte, Ind., set a new record of 175-5x in the Pope offhand match.

Honors in the Aurora, Ill. Rifle Club's Small-bore Match on September 29 went to Chester McAvoy of Highland Park, Ill. McAvoy won the Dewar, took second in the fifty-yard match, and third in the 100-yard event to place first in the aggregate with 1181-47x. Robert Spahr, also of Highland Park, won the 100-yard match, and Eugene Snodgrass, Gary, Indiana, won the fifty yard.

☆ ☆ ☆

John Holle of Arlington, N. J., was high in the aggregate of the Wynockie Valley Small-bore Match at Midvale, N. J., September 22, scoring 793-48x in the aggregate to win over Jesse Barton's 793-47x. Walter Klem and Mike Balsan, Jr., both scored 788-34x to finish first in the Expert and Sharpshooter Classes, respectively. Bill Kopper's 775-33x and Winifred Carr's 761-22x gave them first in the Marksman First and Marksman Classes respectively.


Let Me Shoot an Offhand Score So Good That in Telling About It, I Cannot Lie!

Anthony Zar, of Wauwatosa, Wis., was awarded a large drawing of the above for high offhand score in a recent match between the Falk Rifle Club and the Supercharger Rifle Club.

The Tenth Annual Small-bore Tournament of the Wilmo Rifle Club, held at Cincinnati, Ohio, September 21 and 22, went to the 3174-185x scored by Gilbert Twyman of Louisville, Ky. Earl Saunders, Louisville, Ky., won the first day's aggregate and Luther Earnhardt, Springfield, Ohio, took the second day's. R. T. Boar, Louisville, Ky., was second in the grand aggregate with 3160-169x; third with 3143-151x was Stoner Abell, also of Louisville.

☆ ☆ ☆

A speedy return trip from Camp Perry put Robert Perkins, Fresno, Calif., at the Northern California Rifle Championships in Richmond, September 14 and 15, in time to win that championship. Perkins scored 1974-110x to take the two-day shoot from Henry Wright of Fresno, who scored 1972-108x, and Bud Wickersham, who tallied 1967-98x.

☆ ☆ ☆

Jack Ahern again won the San Francisco Police Monthly Pistol Match at Lake Merced, Calif., September 15, scoring 1051 for the day's shooting to win over Quentin Brooks' 1049.

D. Coble won three muzzle-loading matches at 100 yards and the aggregate of the Blue Mountain Muzzle-Loading Ass'n tournament held in Shartlesville, Pa., on October 5 and 6.

☆ ☆ ☆

T/Sgt. H. L. (Joe) Benner of Fort Knox, Ky., added another to his numerous victories by winning the aggregate of the Falls City Pistol and Revolver Tournament, held in Jeffersonville, Indiana, October 6. M. A. George, who won the .22 caliber National Match event with 287, was the only person besides Benner to win an individual match. D. F. C. Reeves, Jr., Madison, Tenn., was second in the aggregate with 1380 to Benner's 1448. Class winners were: Expert, Major P. B. Gritta, Fort Knox, Ky., 1355; Sharpshooter, H. A. Fitzgibbon, Louisville, Ky., 1331; Marksman, Lt. J. S. Yarbrough, Fort Knox, Ky., 1285.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACTS OF CONGRESS OF AUGUST 24, 1912, AND MARCH 3, 1933 AND JULY 2, 1946.

Of THE AMERICAN RIFLEMAN, published monthly at Washington, D. C., for October, 1946.

District of Columbia, ss:

Before me, a notary public, in and for the State and county aforesaid, personally appeared C. B. Lister, who, having been duly sworn according to law, deposes and says that he is the Editor of THE AMERICAN RIFLEMAN, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher: National Rifle Association of America, 1600 Rhode Island Ave., Washington 6, D. C.

Editor: C. B. Lister, 1600 Rhode Island Ave., Washington 6, D. C.

Managing Editor: W. F. Shadel, 1600 Rhode Island Ave., Washington 6, D. C.

Business Managers: Executive Committee, National Rifle Association of America, 1600 Rhode Island Ave., Washington 6. D. C.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.)

National Rifle Association of America. 1600 Rhode Island Ave., Washington 6. D. C. No stockholders.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the twelve months preceding the date shown above is . . . (This information is required from daily publications only.)

C. B. LISTER, *Editor.*

Sworn to and subscribed before me this 1st day of October, 1946.

LOUIS Q. BRADLEY,
(SEAL) *Notary Public.*
My commission expires May 14, 1951.

DOPE BAG

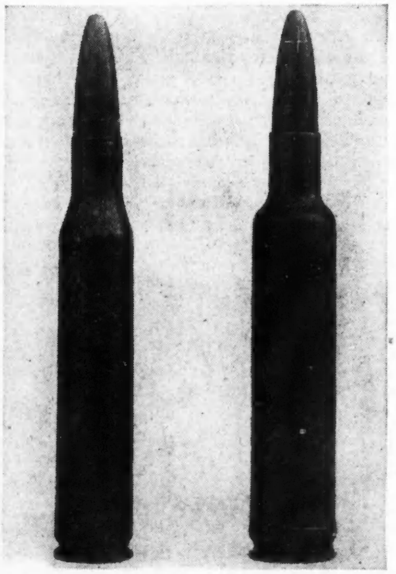
Conducted by Major General J. S. Hatcher
Edwards Brown, Jr., A. H. Barr, J. L. Murphy, J. S. Rose

THIS MONTH:

.270 Weatherby Magnum · .45-70 Smokeless Loads · Shotgun Shells · Czech CZ 9 mm. Mashburn Developments · Saeco Powder Measure · Wrong Cases · Clear Vision Front Sights · Bullet Jackets Stuck in Bore Substitute for No. 80 Powder · Black Finish on Aluminum · Gewehr 33/40 · German Field Glasses · 2-R Lovell Loading Problems

.270 WEATHERBY MAGNUM CARTRIDGE

There has been considerable interest in some of the modern high-velocity Magnum cartridges, particularly the .270 Magnum intended for long-range, big-game hunting. We have finally completed some tests, including accuracy, with one rifle at least. One thing is certain. The best of bullets is necessary to get really fine accuracy when the velocity is quite high.



The factory .270 (left) and Weatherby's .270 Magnum (right)

Almost any bullets tried, though, would give two minutes-of-angle accuracy, or about eight-inch groups up to 400 yards or more. We approached minute-of-angle accuracy with the latest Weatherby-made 130 grain bullets.

According to Weatherby's loading dope for his .270 Magnum, he went up to 73.0 grains No. 4350 with 130 grain bullets, giving an estimated 3700 foot-seconds velocity. We were satisfied to stop at 68 to 69 grains as giving the best accuracy at an estimated 3500 feet velocity.

Regardless of what the muzzle velocity is, almost everyone is interested in what the actual bullet impact is over the average hunting ranges.

As we had a greater quantity of 120 grain Barnes bullets on hand than of any other make, most of our shooting was done with this bullet.

The cross hairs of the K2.5 Weaver with 6X Litschert attachment in the Redfield Junior mount are 1.45 inches above center of the bore of our .270 Magnum. With this combination, using the 120 grain bullet and 68.0 grains No. 4350, actual impacts were one inch high at 100 yards, 0.35 inch low at 200 and 14.40 low at 400 yards—a very flat-shooting load indeed. Other good .270 Magnum loads giving equally good accuracy and flat trajectory were 62.0 grains du Pont No. 4895 or the same charge of No. 4064 powder with the 120 grain bullet. The 400-yard groups measured 6.02 and 6.78 inches for the No. 4350 and No. 4895 loads.

The pay-off came with the 130 grain Weatherby bullet. We could almost bet on less than 2½ inch groups at 200 yards regularly, using 66.5 and 68.0 grains No. 4350 powder. To get the kind of ballistics possible with these big Magnum cases one should expect rather short barrel life. After firing 215 rounds there is slight erosion just forward of the chamber of this Graphmo barrel, but accuracy is still fully as good as when the barrel was new.

That sporter (which is shown in color on this month's cover) with the stocking, inlays and checkering by J. D. Bates, indicates the finest of workmanship throughout. The revamped Enfield action is hardly recognizable, with its narrowed trigger guard, floor plate and streamlined bolt handle. The California mesquite stock makes the rifle a trifle on the heavy side for a light-barreled sporter.—A. H. B.

SMOKELESS LOADS IN THE .45-70

"I have a .45-70 Springfield single-shot rifle in new condition. It is a U. S. Model 1884, serial number 478,020. Is it safe to shoot modern commercial smokeless powder ammunition in this gun, or should I stick to black powder? I have a Pacific reloading tool and was planning to reload for it when primers are available again. What would be the best powder and primer for this gun?"—Dr. Lyman W. Paine, Los Angeles, Calif.

Answer: The .45-70 Springfield rifle will safely handle present-day smokeless loads. The arms companies had in mind a gun designed for black-powder loads when they loaded that smokeless ammunition. I am sure you will find it more accurate than the old black-powder loads and quite safe to use. The velocity of the smokeless loads is around 1300 feet per second with the 405 grain bullet.

I believe your best powder for reloading would be Hercules Lightning. With the 405 grain bullet I think you will find around 23 to 26 grains of this powder a very good load. You might also find around 20 grains of du Pont 4759 all right, but Lightning seems to be a very good powder for this big case. —A. H. B.

NEW SHOT SHELL CONSTRUCTION

Olin Industries is now putting out their wadless or Super Seal Crimp with the Super Seal Cup Wad and a new wax seal designed to waterproof the nose of the shell, lubricate the cone of the shell chamber, and insure easy extraction of fired cases.

The ⅛ inch thick Super Seal Cup Wad which has a folded flange around its lower edge reminds one something of a beer bottle cap in pasteboard. It rests directly on the powder with the flanged or hollow side down.

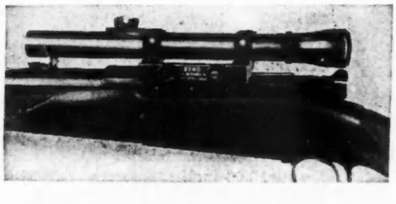
The makers claim the expanding flange seals in the powder gases, preventing their escape past the shot column, thus eliminating blown or low-percentage patterns.

Another claim is that the flange of the wad being forced out against the bore exerts a scraping or cleaning action which prevents leading.

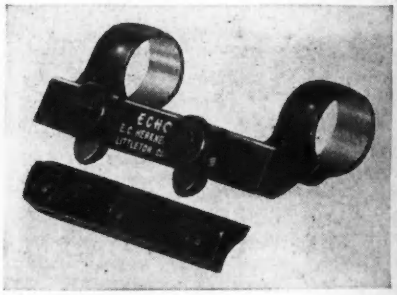
We fired some Western Super-X Maximum loads, 1¼ ounce, No. 6, in a Model 37 Ithaca with Weaver Full Choke. Four well-distributed average patterns gave 75.4 per cent in a 30-inch circle at 40 yards—while one pattern was 62.7, for an average of 70.3 per cent for the five. This is excellent performance.

The Western Xpert Super Trap-load of 1⅛ ounces No. 8 shot, using the same-type Super Crimp and Super Cup Wad did equally as well in the same gun. The average at the same range for five patterns was 72.4 per cent, with four normal going 75.2 per cent. The one low-count pattern with not so even distribution gave a 63.5 per cent at 40 yards.

One other load tried with the same gun and choke combination was Winchester Ranger



Above: An Echo mount fitted to our Mauser action by E. C. Herkner of Littleton, Colo., gave no zero change when removed and replaced between shots. Right: The Echo scope mount itself.



INVENTORS
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Super Trap load of 1⅛ ounces No. 7½ shot. Only four patterns were made with this Super Crimp, Super Cup Wad load. While the average of 70.36 per cent was no better than the other loads, the even and uniform distribution of the shot pellets in a 30-inch circle was quite noticeable for all four patterns. Both the high-velocity Super-X and the Super Trap shells were loaded in 2¾-inch cases.—A. H. B.

THE CZ 9 MM. SHORT

"I read your article on Page 44 of the July issue concerning the Czech automatic pistol, Model 27 (Ceskoslovenska Zbrojovka). I have a pistol of the same manufacture, but it seems to be chambered for the .380 automatic cartridge instead of the .32 caliber mentioned in your article. I am not certain and would like to know if this gun is manufactured in .380 caliber, which seems to fit the chamber and magazine perfectly. The only markings are 'Ceska Zbrojovka A. S. v Praze 179912' on the barrel."—F. Chu, Madison, Ark.

The 9 mm. Czech CZ

Answer: The Czech pistol, Model 27, was made in the 7.65 mm. (.32 A. C. P. caliber). There was also a very similar-looking gun produced by the same maker for the 9 mm. short cartridge, which is the same as the .380 A. C. P. This is the gun that you have. It differs from the .32 caliber model in that it has a locked breech and the unlocking is accomplished by the rotation of the barrel, which occurs when the slide recoils. This permits the use of a very light recoil spring, which makes the slide very easy to pull back in reloading the gun. However, the ammunition must be in good condition to insure perfect operation with this gun as the very light recoil spring does not have sufficient power to chamber a corroded or dirty cartridge with certainty.

This .380 Czech pistol, shown in the accompanying photo, is a very well-made gun, but for the reasons mentioned above, is not as reliable as the .32 caliber which is a straight blowback type and has a comparatively heavy return spring.—J. S. H.

MASHBURN DEVELOPMENTS

For some time now we have been using the Mashburn "Superior" trigger. On our Mauser, it literally fell into place and was adjusted for a clean, light pull in a matter of minutes. The one for the M-1917 Enfield and 30-S Remington did not work quite as well. Experiences of both friend Carl Nix and myself would indicate that some metal must be removed from the receiver where the cut is made for the trigger sear. One anticipated advantage of using the Mashburn trigger was to eliminate a lot of work making a Bull Pup trigger mechanism. Undoubtedly, the Superior can be used for the purpose, with some alterations in the Enfield at least.

Another development which we tried was a rimless extractor for the high-wall Winchester single-shot rifle. Without complete instructions, including the operation of the extractor, we did not fully realize the distinct advantages until explained later by Mashburn. The cartridge is inserted fully into the chamber, with the extractor made so it will slip over the case "rim" and engage in the extractor groove when the action is closed.

Odd indeed was the experience of shooting that big 7 mm. Mashburn Magnum in the light-barreled Winchester single shot. Results were quite satisfactory. The load was the 160 grain W. T. & C. W. bullet and 60 grains of No. 4350 powder, loaded in the Mashburn shop. The groups for 100 to 400 yards using a 15X Lyman Super-Targetspot were: 1.82, 5.22, 5.42, and 10.00 inches, respectively. The impacts without sight change were: one inch above aim, .60 inch below at 200, 5.85 inches below at 300 and 19.65 inches below aim at 400 yards.

With the same powder charge the 160 grain Barnes S. P. grouped in one inch to 1¼ inches at 100 yards for at least 3 groups and 2⅝ inches at 200. Not bad for a light hunting gun!

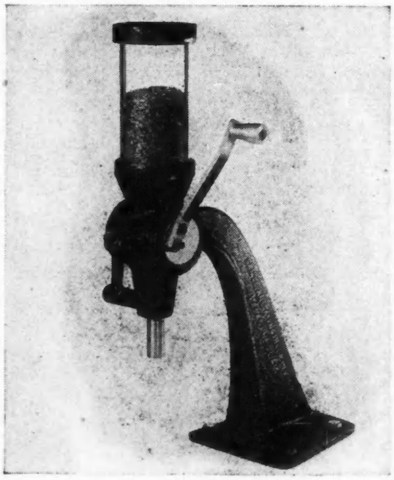
Another Mashburn product is his Super Stock Finish and Filler. It has been used on a number of stocks and when instructions are followed the final outcome is a nice, well-finished gunstock, in a matter of days and not weeks.—A. H. B.

SAECO POWDER MEASURE

The Saeco, a new adjustable powder measure, is a product of the Santa Anita Engineering Co., 2435 E. Colorado Street, Pasadena, California. The Saeco has some desirable features including a visible Lucite hopper.

Very few powder measures have a metering chamber large enough to throw powder charges now being used in some of the big Magnum cases. The large 1½-inch diameter drum of the Saeco should meet all requirements, at present at least. The cylinder for rifle powder charges has a 1$\frac{1}{16}$-inch diameter chamber, which can be adjusted to throw up to 75 grains of du Pont No. 4064 powder. The makers have accepted suggestions that they make a drum which will measure up to 90 grains of du Pont No. 4350. For small charges, another drum is supplied with ⅜-inch diameter metering chamber. Adjustments are made through a hole in the body of the measure. The metering chambers in the drum are drilled on an angle which the makers claim will cause less cutting of the powder grains. The shearing edges of almost any powder measure will cut some powder grains, though. The operating handle may be attached to either end of the drum, for left- or right-hand operation.

When checking powder charges for uniformity we selected two of our regularly used loads. These were 53.0 and 68.0 grains No. 4350. Having learned the technique of operation, there was a variation of .2 grain in throwing at least 50 charges of the 53 grain load. With the 68 grain charge, the extreme variation was .3 grain, as near as could be determined with the No. 980 Brown & Sharpe scale. A variation of at least .6 grain with coarse-grain rifle powder was possible, depending on the method of operation.



The Saeco Powder Measure

Once the operating handle is started downward to dump the powder charge, the movement must be continuous. Sometimes, when trying to clear, rather than cut a powder grain, the handle is reversed slightly. This invariably caused a variation of .5 grain or more. By merely continuing the movement downward, shearing the obstructing grains, exceedingly uniform charges were possible for a coarse-grained powder like No. 4350. Important too is the "knocker." Use it once or twice, being consistent, as otherwise the powder settles unevenly in the hopper, increasing minimum-to-maximum variation.—A. H. B.

WRONG CASES

"I have a bit of interesting news for you. Recently a man brought a rifle to me, a 1913 Steyr, that he bought from someone. This was a lightweight sporter in excellent condition and he said it was a 7 x 57 rimmed. I loaded up a box of ammunition for him and a few days later he returned and said he thought something was wrong. He had already fired a half dozen cartridges. I am enclosing the fired cartridge for your inspection, also a 7 x 64 rimmed. His gun was a 7 x 64 rimmed, the first time I had come in contact with this caliber. It so happened at the time that I was pulling bullets from .35 Winchester ammunition to load into some .35 Whelens, so I took one of the .35 Winchester cases and got out the forming dies, with the result that I was able to make 7 x 64 rimmed cartridges. Will you please pass on this information."—J. W. McPhillips, San Bruno, Calif.

Answer: Thanks for that interesting dope. The sample fired case certainly indicates that when playing with those foreign guns it pays to be cautious indeed. I try to stay on the safe side when in doubt and recommend that the owner make a sulphur cast of the chamber, many of which have been sent in to us. Because of the many requests, we have mimeographed instructions for making a sulphur cast, and mail them to any shooters requesting them.

Fortunately, in this particular case, pressure should have been relatively low with the short 7 x 57 rimmed cartridge in that long 7 x 64 chamber.—A. H. B.

CLEAR VISION FRONT SIGHTS

Several members of our staff have tried Griffin & Howe's clear vision front sights. In this hooded front sight the aperture is made of an unbreakable, optical-quality plastic with a small hole in the center. The edge of the hole is beveled, which causes it to show up as a black ring with clear and uninterrupted vision all around it.

The principle of this sight is not new and there have been similar sights carrying an aperture ring on a transparent disc. However, as far as we know, this is the first one to make use of the wartime advances in optical quality plastic. The unbreakable discs furnished with this sight are so clear that it is difficult to believe that there is anything there, and the aperture ring seems to be suspended in air. The sight is extremely pleasant to use on the target range and gives excellent results.—J. S. H.

BULLET JACKETS STUCK IN BORE?

"I have read in almost every sporting magazine for years about the danger of shooting jacketed Government ammunition with the tip cut off and drilled; that it would blow the core out and leave the jacket in the barrel with naturally disastrous results from the following shot.

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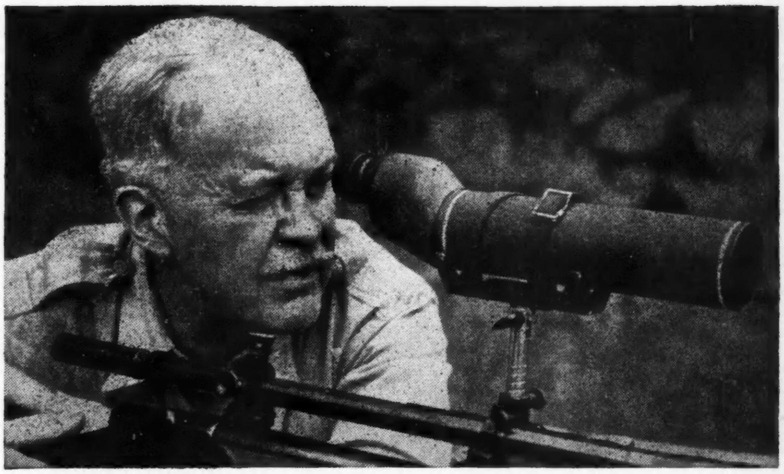

Townsend Whelen, vice president of The Parker-Whelen Company, Washington, D. C., shown with his Argus Spotting Scope. Photo by Howard W. Thomas

"In connection with my rifle shooting, ballistic experiments, and nature study," writes Mr. Whelen, "I have been using telescopes of 10 to 60 power for the past fifty years. Among those portable and convenient enough to use in the field and to transport and set up anywhere, the new 20-power Argus Spotting Scope is easily the best in resolving power, convenience and every other detail. Since its advent, I have been using it exclusive of all others."

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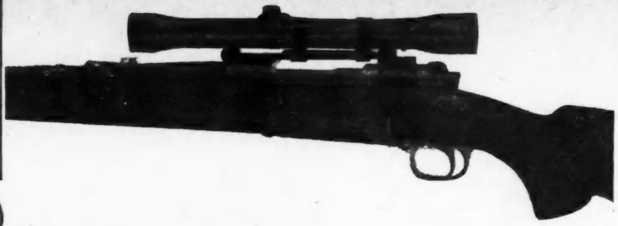

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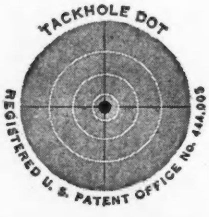
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"Seeing this in print so many times has got me worked up to sending you this very conclusive evidence that you cannot leave a jacket in a rifle barrel using the standard service bullet and powder charge under any circumstances, no matter how cut off and drilled.

"I am sending you herewith the jacket from a bullet pulled from a regular service case, as you will note a 150 grain flat-base bullet. I cut the tip off until it exposed 1/16 inch of lead, and melted all the lead from the jacket and then loaded the jacket back into the original case with same powder charge seated on just enough paper (one square inch of crumpled writing paper) to keep the powder out of the empty jacket.

"I then shot this load at a distance of fifteen feet into pine boards, and got over fifteen inches penetration, and am sending you the retrieved jacket. I think that this should be very conclusive evidence that this jacket-in-the-barrel-blown-out-core stuff we have been hearing and reading for years is a lot of baloney. Anyone who doubts this can try it, or I will send another with witnesses' signatures under oath if desired."—J. T. PHILLIPS, Durango, Colo.

Answer: Many thanks for your letter about the possible danger of a bullet jacket remaining in a gun when a flat-base bullet has the tip cut off to make it expand on game. I think you can correctly assume that such a type of accident occurs very rarely. There are many shooters who use this type of ammunition regularly and it is only once in a very long time that trouble is reported. While we think that this practice is reasonably safe, we have never felt that we could give it an unqualified recommendation because once in a while such an accident does happen.

The test that you made is very interesting indeed. It does not prove, however, that a bullet jacket will not sometimes be left in the gun. In the first place it takes a large number of shots to prove something like this. You might fire 100 shots and have everything all right and then have the jacket stay in on the 101st. Again it seems to me that the greatest chance of having this happen would be with very high pressures and very hot loads. With modern smokeless powders the temperature and pressure of the explosion depends to a large measure on the resistance encountered when burning starts. With your empty bullet jacket there would be very little resistance in front of the powder and the pressure would be comparatively low.

Once I had a gun sent in to me with a slight bulge in the barrel. Examination of the bore from the breech and muzzle ends showed a peculiar looking appearance at one point. I cut the barrel open and found a bullet jacket completely embedded in the steel, successive bullets having passed on through it and just ironed it into the metal. Again I have seen a bullet picked up on the rifle range with a portion of a jacket of another bullet wedged over it where both had passed through the rifling together.

Your test was an interesting one and we appreciate your telling us about it. I can agree with you to the extent that the practice you mentioned is reasonably safe, but I think if you continue it long enough you will eventually run the chance of some such incident as those I mentioned above.—J. S. H.

SUBSTITUTE FOR NO. 80 POWDER

"In prewar days I shot reduced loads of du Pont No. 80 powder and the .32 caliber 80 grain Remington jacketed bullet in a Springfield .30-'06 rifle. Since No. 80 powder does not seem to be available any longer, please put me right on the following questions:

"Is du Pont No. 4759 powder taking the place of No. 80, and can it be loaded the same as No. 80—that is with a scoop measure (volume, not weight)?

"Is the ignition satisfactory on an approximately ¾-filled .30.'06 case, and what would be the approximate velocity and pressure?

"Please give me the formula of a tested load using the .30-'06 Remington 80 grain .32 caliber jacketed bullet.

"Can No. 4759 powder be loaded behind the 172 grain boattail bullet?"—Phillip H. Meise, New York, N. Y.

Answer: du Pont No. 4759 replaced No. 80 and while there is no specific reloading data available as to velocity and pressure, you can use the old No. 80 loads as a relative guide. Sometimes you will not get complete combustion and will have to increase the powder charge a grain or two.

I would not use this powder with the heavy 172 grain boattail bullet as there is a chance that light loads may not force this heavy jacketed bullet entirely out of the bore.—A. H. B.

BLACK FINISH ON ALUMINUM

"I am making a rifle scope out of aluminum and am wondering what is the best way to give it a blue or black finish inside and out. Do you have any good ideas?"—Oran Zimmerman, Los Angeles, Calif.

Answer: It is difficult to obtain a blue or black finish on aluminum which is desirable and satisfactory for all purposes. This must be done by an electrolytic process, which requires a rather elaborate setup. A black coating which is not very durable but is satisfactory for *most* purposes can be had by using one ounce each of white arsenic and iron sulphate, to which is added twelve ounces of hydrochloric acid and twelve ounces of distilled water. The aluminum must be scoured with pumice and water to remove all grease, after which it is immersed very briefly in a weak lye solution and rinsed immediately; then immersed in the recommended solution, slightly warmed, until black. Dry in fine clean sawdust and then lacquer.—A. H. B.

GEWEHR 33/40

"I have a German rifle which I think shoots the same ammunition as the Model 98 Mauser, but it is a shorter rifle. On top of the barrel just ahead of the bolt and on top of the chamber the number '7.88' is written and below that are the letters 'dot' and the date '1942.' On the side of the receiver is 'G.33/40.' Will the ammunition used in the Model 98 Mauser fit in this rifle safely, and is this ammunition the 8 mm. shell?"—Carl A. Hoffman, Crestline, Ohio.

Answer: The gun is a Czechoslovakian extra lightweight carbine, called by them "VZ 33." The Czechoslovakians used the same ammuni-

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Shown above, Model A tool with three dies. Retail price

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Pistol Ammunition: .32 S. & W. long, .38 S. & W., .38 S. & W. special, .38 ACP (Super), 7.63 Mauser, 7.65 Luger, 9mm. Luger, .38/.40, .44 S. & W. special, .45 ACP, .45 Auto Rim, .45 Colt long. Above dies $12.50 per set (resizing die and bullet seating die). Powder measure adaptor die $2.50 each additional.

UNIVERSAL dies are interchangeable with the fine Pacific dies and can be used either in UNIVERSAL or Pacific tools.

*Prices shown on above tools include one complete set of dies for any one caliber (not including powder measure adaptor die, which is $2.50 additional). Discount to Dealers.

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tion as the Germans, namely: 7.9 mm. "G. 33/40" is the German designation for this gun. The one you have was made by Waffenwerke Brunn A. G., Brunn (Brno, Czechoslovakia), as shown by the code letters "dot." While this gun has been lightened considerably over the standard Mauser action, it is an exceptionally strong gun and will stand just as much as any of them. It is chambered for the regular German 7.9 mm. cartridge, which in this country is called "8 mm." The gun will use the regular 8 mm. Mauser (8 x 57 mm.) as manufactured and sold in this country by the large cartridge companies. Normally this cartridge can be obtained in any of the larger sporting goods stores, but is temporarily almost unobtainable owing to war shortages.—J. S. H.

GERMAN FIELD GLASSES

"I have a pair of German binoculars marked 'Dienstglas 6x30, No. 200,540,' and letters 'ddx.' What kind of glasses are these? Will it pay to have them repaired and who would do the job?"—Alderson M. Cullsman, East Cleveland, Ohio.

Answer: Your German binocular is a high-grade glass. It is one of the standard German army binoculars and, in fact, the word "Dienstglas" means service glass. The figures "6x30" mean that it is 6 power and has a 30 mm. objective.

These standard German army glasses were made to government specifications by a large number of makers. Yours was made by Voigtlander and Sohn A. G. at Braunschweig, as shown by the code letters "ddx." Your glass is well worth repair and I would suggest you send it for an estimate to any one of the dealers advertising such work in The American Rifleman.—J. S. H.

2-R LOVELL PROBLEMS

"I am having trouble with my 2-R Lovell. Every time I have to reload I have to discard several cases because of loose primers, although I have never used more than 15 grains of 4227 with 45 or 50 grain bullets, so my load is not too heavy. I am now using 16 grains of 4198 with a 50 grain bullet to lower the pressure further. I find that sometimes after only one firing the case cannot be used again because of the primer fitting too loosely.

"Is there anything I can do? Ness writes of using 17.5 and 18 grains of 4198 in the 2-R. I do not see how he does it; I cannot get more than 16.5 grains in the case even when I tap it in and pour it in slowly."—Bob Miller, Ann Arbor, Mich.

Answer: With a properly chambered rifle you should not get enlarged primer pockets unless your loads are developing excessive pressure. High pressures can result from oversized bullets or subdiameter barrels or what is very likely, the combination of tight bullets plus cases too long for the chamber. I always trim my cases to 1⅝ inches, or slightly shorter than the chamber. Even in a good rifle, closely head-spaced, I trim them after every three or four loadings.

First, check those cases for length and then trim every one of them that is over 1⅝ inches long. Then push a soft lead slug through the bore and mike it for the diameter. It should be not more than .001 inch smaller than the bullet diameter.

There is really little you can do to reuse the cases that have expanded pockets. There is not enough brass to ream them out to take the large-size primer.

I believe that the 17.5 to 18 grains of 4198 you read about was in reference to loads in the Improved or "maximum capacity" Lovell. Our standard load in a Gebby-chambered 2-R was 16 grains of 4198, which filled the case level full, so the powder had to be compressed when the bullet was seated. This is safe in a properly head-spaced rifle with the groove diameter fully as large as the bullet diameter.

I had that combination in a Diller relined job rechambered by Gebby, but many of the 2-R Lovells, as made by different gunsmiths, have chambers of smaller capacity and very often 16.5 grains of 4198 seem to be the maximum—A. H. B.

POISONED BY JAP RIFLE STOCK

"Recently I have had two very unpleasant and mysterious attacks of a dermatitis like that produced by poison oak and ivy. I thought you might be interested to know that tests have finally traced the trouble to the dust produced in working on a Japanese military rifle stock. The stock is not walnut, and I have been unable to identify the wood.

"The dermatologist who treated me says that while the violent irritant action may be only a personal allergy, it might also extend to many people. Therefore, I am passing the information on to you in hopes that it might do somebody else some good.

"If you happen to know what the wood might be, I would appreciate your telling me."
—Richard S. Bylin, San Marino, Calif.

Answer: We have checked with the Forest Service of the United States Department of Agriculture, who tell us that the wood in a typical Jap stock we sent them for examination was some species of walnut, a number of different varieties of which grow in Japan, Korea, and Manchuria. They also referred us to a very interesting paper on poisonous woods by George A. Garratt in *The Journal of Forestry* for 1922, Volume 20, pages 479-487. Woods which are listed as offenders in this regard are cocobolo, boxwood, satinwood, teak, cocuswood or green ebony, Indian rosewood, Australian moa-wood and a few other less common ones.

The author of this paper says:

"No harmful effects are felt in handling the finished products made from any of these woods. It is only in the stages of woodworking in which considerable dust arises that the toxic principles are liberated and the poisoning occurs.

"The poisons contained in the wood may result in intense itching and swelling of the skin, inflammation of the membrane of the eye and nose, paralyzation of the motor nerves, heart depression, constitutional symptoms or other effects, and in some instances serious illness has resulted. However, no case is known which resulted fatally."

While it is not listed, it may be that one of these Oriental varieties of walnut might do the same thing as the various woods described above. On the other hand, your experience may have been due not to the wood itself but to something in the varnish or dressing that the Japs used on the stock. Tung oil is a very popular ingredient in varnishes in China and Japan. Some people are violently allergic to Tung oil, and a slight trace of it might produce alarming symptoms.—J. S. H.

A NEW Samworth Book on Firearms

PROFESSIONAL GUNSMITHING

By Walter Howe

In keeping with the Samworth policy of bringing to shooters, guncraftsmen and gun lovers the best and most up-to-date information on the upkeep and repair of firearms, this publisher is proud to announce that "Professional Gunsmithing" is now ready for distribution. With the multiplicity of books on that subject now available, another offering must indeed be good to justify publication. Here is a new one which automatically takes its place at the top of the ladder, and it will maintain that position for a long time to come.

Walter Howe is a professional gunsmith of many years standing, topped off by five years of further application as a Chief Armament Inspector with the Army Ordnance Department during World War II. He is qualified to speak with authority on all phases of the craft.

Anyone entering the gunsmithing field, either as a means of livelihood or merely to work on their own personal firearms, will find a mass of applicable material contained in this volume. Howe has taken up the subject of commercial gunsmithing in a broad and comprehensive manner, approaching it from the angle of basic principles and logical reasoning. He tells how to diagnose gun troubles when the weapon is brought in for repair and treats fully of the general reasons and causes for such repairs being necessary. By applying Howe's "approach" to the problem in hand, any gunsmith will be enabled to expeditiously, correctly and profitably remedy the fault or repair the defective part.

Walter Howe knows whereof he speaks; accordingly his instruction is concise and practical. He treats in detail the specific jobs and types of repair work which his lifetime experience as a practicing gunsmith to the trade and to individuals has shown to be most frequently brought into the gunshop, day in and day out. The amateur will appreciate this instruction as the advice of a master hand; the professional will be impressed with its clarity and practical application to the problems which confront him daily.

Amongst the wealth of material contained in this volume is included clear, logical information as to how best to set up a gunshop and, what is more important, how to keep it going on a profitable basis. Such subjects as business set-up and customer relationship have been thoroughly gone into, as well as several specialty lines which will provide a satisfactory source of revenue. Necessary tables of technical and mechanical reference are included, and the listing of sources of supplies for all gunsmithing materials is the most extensive yet published.

This book is definitely not a rehash or compilation of material that has appeared previously in other books or articles. It is original throughout and presents in readily understandable language much material which, for some unknown reason, has in the past been left for the newcomer to figure out the hard way. Walter Howe's "Professional Gunsmithing" will prove of equal value to the established craftsman or to the beginner. It is today's outstanding textbook for the gunsmithing profession.

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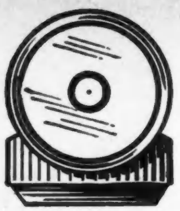

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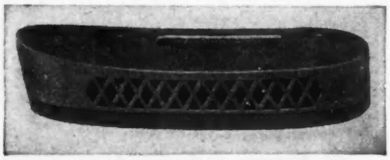

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RIFLED SLUGS IN SHOTGUN

"This fall I intend to do some deer hunting. Rifles are prohibited in the county I want to hunt in. Hence, I have decided on a 16 gauge shotgun which I intend to use with rifled slugs for deer. What type of choke should I get to use on this single-barrel shotgun, as I might also do some duck hunting?"—KENNETH B. GRAYSON, Brooklyn, N. Y.

Answer: With rifled shotgun slugs you will get better accuracy in a modified choke than with a full choke, but the full choke is better for duck shooting, and will still give you very good accuracy for short range. If you are certain there will be no duck shooting, then the modified choke will be best and will give you slightly smaller groups or a little better accuracy with rifled slugs. Even buckshot will give a somewhat more uniform pattern in the modified than in the full-choke barrel.—A. H. B.

16-INCH TWIST FOR VARMINTER

"Can I safely use .22 caliber jacketed bullets of .224 inch diameter in a 16-inch twist Springfield .22 caliber M2 barrel screwed into a Rock Island Arsenal M 1903 receiver and chambered for the .22-250 Magnum (commonly called .22 Varminter)?"—EVERETT H. SIMONTON, Portland, Ore.

Answer: You can use the .22 M2 barrel in the 1903 receiver, but I do not recommend it for the .22 Varminter. The diameter of that barrel will be somewhat under .224 inch, and at high velocity you will get fliers. In addition, the 16-inch twist would be okay only for the shorter bullets, but not for the long, heavy ones. It takes a 14-inch twist for anything above 55 grains. I would much prefer paying a little more and getting a barrel of .224 inch bore and 14-inch twist for the Varminter."—A. H. B.

HOMEMADE BULLET LUBRICANT

"Will you please give me any information you may have on the subject of bullet grease for lubricating lead pistol bullets for handloading."—E. G. MOCK, San Diego, Calif.

Answer: For a good many years we have been making up our lubricant, and I believe our formula will exactly suit your needs, as we never have leading troubles with it.

It consists of equal parts beeswax and paraffin, tempered to a tough pliable consistency by adding Vaseline or a good grade of cup grease, such as Pennzoil No. 305, which contains graphite.

After the waxes are melted together we add about 25 per cent by volume of cup grease or Vaseline. Then several samples are tested for consistency by cooling one sample at room temperature and another in a shallow pan in the refrigerator. If the mixture is very stiff when cool, we add more grease, or if it is too soft, we add more wax. Add fine powdered graphite if you want a black lubricant.—A. H. B.

RED-HEAD RELOADING PRESS

While visiting Charles C. Johnson, in Thackery, Ohio, I saw some of his Red-Head presses in the process of assembly. These presses have a turret head, as is found on the Universal presses sold by the Hollywood Gun Shop. The Red-Head, however, is not as heavily constructed as the Universal. Nevertheless, it is well designed and is adequate to perform accurate handloading operations for which it is advertised.

Johnson does not claim that it is powerful enough to do full-length resizing of the larger rifle cases. However, it is rugged enough for complete resizing any of the pistol, revolver, or small rifle cartridges. The press is designed to use Ideal tools but Johnson is supplying his own tools for some cartridges.

The Red-Head press complete for one cartridge sells for $14.50. The press only, including shell holder, priming punch, and bushing sells for $10.00.

At the time I visited Johnson he was having some trouble in obtaining tools, but he expected to overcome this difficulty in the near future.—E. B.

FLUSH-TYPE KRAG MAGAZINE

"I was wondering if you could give me any dope on the conversion of a Krag to a sporter and particularly the changing of the box magazine to the flush type. If not could you give me information as to where I can obtain such information."—I. L. GORDON, Upper Darby, Pa.

Answer: For instructions covering that magazine job you might try Merton Mealy, 311 West Front, Oil City, Pa. He at one time had blueprints, I believe, telling how to go about the complete alteration of the Krag magazine. Likewise, you will find one method described in Clyde Baker's book "Modern Gunsmithing." This book sells for $4.50 through the NRA Book Department. The Hart Arms Company, 2185 East Second Street, Cleveland, Ohio, at one time did a very good Krag magazine alteration job.—A. H. B.

LONG MAGAZINE FOR .257 ROBERTS

"I have heard that it is best to have a gunsmith lengthen the magazine on .257 Roberts rifles so they will take cartridges three inches long, it being stated that better results can be obtained with handloaded ammunition if bullets are not seated so deeply as is required in the standard magazines. Do you agree in this? Will the magazines thus lengthened take regular-length factory-loaded ammunition and feed it as well?"—CHARLES W. TADLOCK, St. Louis, Mo.

Answer: If you plan to use the very long pointed 100 grain or 125 grain Barnes bullet, it would be advisable to have the magazine lengthened. It would still handle the factory ammo. Should you plan to use only lighter bullets, or up to 100 grains, then lengthening of the magazine is unnecessary.—A. H. B.

GUNSMITH TRADE DOPE

Leo Guley and Bill Parker, of 2826 Pinewood Ave., Baltimore, Md., write that since leaving the service they have merged and are specializing in general gunsmithing, rebluing and restocking of military firearms.

☆ ☆ ☆

M. M. Schmidt, of Schmidt & Davis, 3347 San Fernando Road, Los Angeles, Calif., has reverted to a special "heavy-duty" alloy main-

YOU'LL CHERISH A COPY OF NEW THIRD EDITION OF "THE KENTUCKY RIFLE" and here are the reasons why.

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"The Kentucky Rifle" is a book every American—not just collectors or muzzle loaders—will enjoy, because it is the story of American manufacturing on the frontier and practical American pioneer marksmanship.

The heavy, crude, badly sighted guns that the early colonists brought from Europe simply did not fill the needs of the American frontier of 1700, and our pioneer ancestors looked to the gunsmiths around Lancaster, Pennsylvania, for the rifle they needed. Today these rifles are prized possessions of shooters everywhere. And the one authoritative book about the Kentucky rifle and pistol will be prized by everyone who is fortunate enough to get a copy. Why not show this advertisement to your family and hint how much you'd like a copy for Christmas?

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If you haven't yet discovered the shooting pleasure you can get by reading about rifles, pistols, shooting of all sorts, you've got a world of fun in store for you as you accumulate your shelf of shooting books. And the number one book on your shelf should be "The Kentucky Rifle."

This great classic is filled with fascinating facts, documented information, specific details and pictures of the first American-made rifle—the first really accurate rifle the world ever knew. When you read about this truly astounding firearm that was developed on our 1730 frontier—when history shows you that without it we probably would have lost the Revolutionary War—when you read the pages of this book, you actually thrill to the realization that right here in America rifles that were made by hand to meet the needs of the frontier can still outshoot many rifles in use today.

Haven't you often wondered just how those old gunsmiths welded iron bars into barrels and then rifled them by hand so that their best would shoot inch-and-a-half groups at 100 yards? Captain Dillin explains in detail, with photographs of the crude tools they used to turn out rifles that were just shy of perfection.

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For the collector and antique dealer its information concerning the manufacturing characteristics of the various riflesmiths—and a long, authentic list of their names and localities—is absolutely invaluable. There is also helpful, money-saving information on how to recognize spurious "Kentuckies" and forgeries.

For every American, this book will bring a fascinating, detailed story of one of the most important—and romantic—periods in American history—and the American-made rifle that made it possible.

There are twenty-one chapters packed with specific, authoritative, documented details and information covering every aspect, from manufacture to actual results on targets and game—and as a military weapon, for it was a Kentucky Rifle—and the skill developed with it—that gave the American colonists such a superiority over the British in the Revolutionary War.

The chapter on the Revolutionary War will give any boy or girl a new interest in American history as well as marksmanship, and will provide source material for prize-winning essays. No school, college or public library or museum should be without a copy.

The arms curator of a world-famous museum (name on request) states: "Dillin's book is its own best recommendation. All competent students consider it authoritative. Any book dealing with artistic, historical, and technical information which is not superseded in over a score of years is necessarily indispensable to the student. Dillin's 'The Kentucky Rifle' is such a book."

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The fast-growing interest in Kentuckies has put even a modest collection far beyond the means of most of us. But this book, with its remarkable pictures of individual rifles and collections . . . targets . . . rifle-making tools, powder horns, game bags . . . water mills . . . and handwritten bills, gives you—in effect—an invaluable collection of your own. Since many of the collections Dillin photographed have been broken up and spread far and wide, it will never again be possible to collect—even to be photographed—such outstanding examples.

In spite of shortages and plaguing production problems, we have published this new, enlarged edition of Capt. John Dillin's "The Kentucky Rifle" because we think that a lot of shooters are missing many delightful hours simply because they don't know what they're missing—and because the first two editions are as hard to come by as a Patterson Colt, almost.

The new edition is just going to press, and it looks as though there will be about 275 pages, eight by eleven inches, or a trifle larger, and bound in fine, blue Devron, with the title stamped in gold. The binder has promised delivery before you read this advertisement; so don't delay! Get your order in right away. And remember—it will make an ideal Christmas gift for any shooter. Ten dollars per copy by mail, or your bookstore can get it for you. Send your check or money order today so you won't be disappointed. Supply limited.

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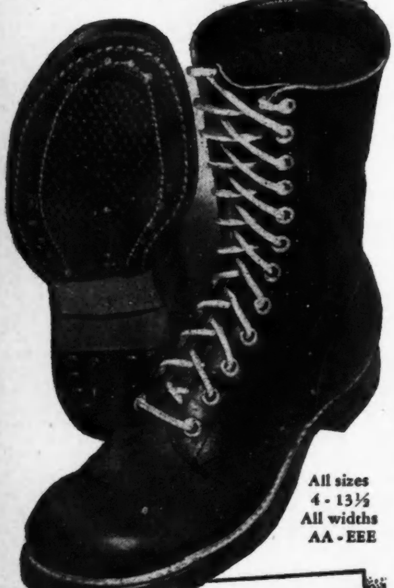

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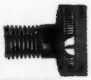

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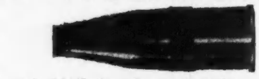

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spring for various actions. The new firing-pin springs, according to the maker, are even better than the square stock used in the older heavy mainsprings. They look mighty good to us.

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Freeman Kent and L. A. Freer, two good men whom we have known for a long time, are in the gunsmithing business. They have ample space for their well-equipped shop on the third floor of Thurman Randle's Sporting Goods Store in Dallas, Tex. Both are well-established gunsmiths, with Kent specializing in rifle work and Freer doing the shotgun jobs. First-class gun building is a specialty.

☆ ☆ ☆

The Miracle Products Co., 44 N. Albany Avenue, Chicago, Illinois, announces that their "Genuine Mother-of-Pearl" revolver grips are back on the market again at lower than their 1938 wholesale prices. Available for immediate delivery are grips for several Colt revolvers, including the Pocket Positive, Police Positive, and Bankers Special.

☆ ☆ ☆

Robert S. Thomas, that optical repair man of Silver Spring, Md., now has descriptive literature covering the type of repair work he can do. A specialty is the "Tommy Dot" or dots which he can install in any type of scope, but especially for the foreign scope owners. A stamp will bring the literature along with price list. Thomas has also installed a number of those dual range-finding cross wires, having placed them as close as .004 inch in a 6X scope.

☆ ☆ ☆

Eddie Bauer, Alaska Outfitter, Seattle, Wash., has a new fall catalog with many illustrations, some in color, of his big line of down-filled clothing, sleeping bags, robes, and other cold-weather equipment. Some new items have been added. The latest price list is included along with an interesting booklet, "Pure Down For Warmth."

☆ ☆ ☆

Ray Riling, collector and dealer in old arms and gun literature, has sent us a mimeographed series of bibliographies which are extremely interesting and most important to the collector and researcher in the small-arms field. These are in the form of indices of pertinent articles which have appeared in "The Magazine of Antiques" between October, 1922, and October, 1945; and in three publications no longer printed, "The Gun Report"—November, 1939—April, 1942; "The Magazine of Antique Firearms"—April, 1911—August, 1912; and "Stock and Steel"—March, 1923—July, 1923. Mr. Riling says that if enough interest is shown in this idea he will continue the bibliography with further indices from additional sources. The price of these mimeographed reports is 50¢ for "The Magazine of Antiques" and "Stock and Steel" and $1.00 for each of the others. The price is nominal and the job worth while. Mr. Riling's address is 6844 Gorsten Street, Philadelphia, Pa.

☆ ☆ ☆

Guns, Bellport, Long Island, N. Y., has just sent in Volume I, No. 1, of a brand-new magazine for sportsmen and collectors. The name of the publication is the same as that of the company—just "Guns." The first issue has twenty-five pages and is well illustrated. It seems well worth the subscription price of $2.50 a year.

THE ARMS CHEST

GENERAL REQUIREMENTS APPLICABLE TO CLASSIFIED ADVERTISING

1. Transactions Based on Good Faith: ARMS CHEST transactions are based on good faith and mutual satisfaction. Deliberate misrepresentation, disregard of usual business ethics or the attempt to circumvent these general requirements, when brought to our attention, will result in refusal of further advertising and might result in disbarment from the NRA in the case of members.

2. All Orders Subject to These Conditions: WE reserve the right to edit all copy to conform with our standards and to reject or discontinue any advertisement which we consider undesirable.

3. Who May Advertise: The ARMS CHEST is an open market trading post. Any individual or firm whose advertisement and methods of doing business meet our requirements may advertise their goods or services.

4. Rates: All advertisements must be accompanied by remittance. The rate is 15 cents per word including name and address—minimum charge $2.00.

5. Definite Prices Must Be Stated: A specific price must be stated on all items offered in FOR SALE and SELL or TRADE ads—except that the phrase "write for catalog" may be used when listing merchandise in quantities.

6. Blind Ads Not Acceptable: Box number or blind ads will not be accepted. Give your complete name and address, to insure prompt delivery of all mail or telegraph replies.

7. Firearms for Sale or Trade Must Be Defined: The *condition* of every gun (including essential parts) advertised for sale or trade, *must* be specified according to *NRA standards*, as follows: PERFECT—meaning factory condition; EXCELLENT—meaning new condition, implying negligible amount of use; VERY GOOD—meaning practically new condition, implying little use, with no appreciable bore wear and only minor surface scratches or wear; GOOD—meaning moderate use with some finish worn off, only moderate bore wear, with no pits and nothing worse than a little roughness in the bore; FAIR—meaning no parts missing necessary to use of gun, reasonable wear inside and out, nothing worse than minor pits in steel or stock, gun sufficiently accurate for hunting. POOR—meaning marred appearance and pitted or badly worn bore.

8. Non-Specific Phrases Barred: Phrases such as "highest" or "top prices paid," as well as any other so-called "auction-type" phrases are not acceptable. The terms "fair price paid" or "state price wanted" may be used.

9. "Outlawed" Firearms Defined: The sale of certain firearms is outlawed by Federal law unless handled by a Federally licensed dealer. These include machine or submachine guns; sawed-off rifles and shotguns with barrels of less than 18" and Mauser and Luger auto pistols *with holster stocks*.

10. Requesting Privilege of Examination: We *insist* that purchasers desirous of examining merchandise before acceptance request shipment by express C. O. D. with examination privilege. This procedure permits the purchaser to inspect the merchandise *in local express office* and authorizes the express company to return unsatisfactory merchandise at shipper's expense.

11. How to Count Numerals, Etc.: Groups of figures are counted as one word (example: .30-30, 250-3000, $150.00, $1.50).(Abbreviations consisting of initials or single characters likewise are counted as one word (example: W. H. Smith; H. B., meaning heavy barrel; HP., meaning highpower). Hyphenated words are counted as two words (examples: 20-gauge, pearl-handled, no-slip).

12. Responsibility for Illegible Copy: Type or print advertisements plainly, as we can not be responsible for errors due to illegible writing.

13. Closing date: All advertisements must be received by not later than the 1st of the month preceding date of issue. (Example: the 1st of December for the January issue. Ads *received* after the 1st of December, *and not later than the 1st of January* will be inserted in the February issue.)

FOR SALE

OUR LIST OF MODERN ARMS WILL BE sent on receipt of three cent stamp. Kimball Arms Company, Woburn, Mass. tf

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BUILD YOURSELF A CAPLOCK "SPORTER" we furnish new, rifled .58 cal. barrels $7.50 with sights; proper hammer $2.50; steel loading rod $1.00. Use any 1864-84 Springfield stock (45-70 carbine preferred). SAFE AND ACCURATE. James Serven, Santa Ana, California. tf

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USED RIFLE SCABBARDS, BROWN COWHIDE leather. Military type. Complete with a ¾" x 40" and a ¾" x 30" straps. Length 30½". For carrying rifle on animal or vehicle. Excellent condition $3.50 each. Good condition $2.50 each. Used .45 caliber pistol holsters, brown leather with belt hook and button down flap. Condition good. 65¢ each. Dept. R., Bolin's Gun Shop, 9 Grand St., South Amboy, New Jersey. tf

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$1.00 DELIVERS HANDSOME SOLID BRASS rifle rod outfit, postpaid. Includes patch tip, one finest quality phosphor bronze brush, one soft bristle. State caliber desired, .410 also. Same except two piece jointed rod, canvas kit, $1.25. Woodford Mfg. Co., Lyndhurst, Ohio. tf

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BINOCULARS, NEW RIFLE SCOPES, NEW fireproof small chests, security safes. Books, guns and gunsmithing, outdoor subjects, military. List, stamp. Langguth, Taggart St., Boise, Idaho. 12-46

CATALOG OF ANTIQUE PISTOLS, REVOLVERS, guns, rifles, edged weapons, armor, accessories, books and antiques, listing over 1200 items with 60 photo plates, illustrating over 850 items for sale in the catalog, price $1.00. H. A. Brand, 704-G, Ingalls Bldg., Cincinnati 2, Ohio. 8-47

THE REVOLVER TIMING RECORD—A 10-INCH RCA-Victor phonograph record. Practice timed and rapid fire anywhere, BY YOURSELF. Nothing to watch, just listen. For "Dry" shooting, basement and outdoor ranges. One side 10 second timing, other side 20 second timing. Plays on any phonograph, $1.50 postpaid. The Original Sight Exchange, Box J, Paoli, Penna. 2-47

WE BUY, SELL, TRADE SHOTGUNS, RIFLES, revolvers, ammunition, outboard motors. Scaramuzzo, 601 South Halsted, Chicago 7. 3-47

BUY BLACK POWDER IN 25 POUND CANS. Fresh stock and up to U. S. Specifications. In FFg only. Shipped from magazine in Northern Ohio $9.50. Groups should join to use this large container—you pay freight on 100 pounds in any instance, so buy big. E. M. Farris, 210 Chillicothe St., Portsmouth, Ohio. tf

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CASWELL TARGET CARRIERS GIVE THE shooter every possible point because they hold the target steady and require no exertion to operate. Fully equipped with speedy ball-bearing pulley wheels and target holders for every type of indoor paper rifle or pistol targets. Government priority not required. Caswell Target Carriers, Anoka, Minnesota. tf

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USE THE NEW GAS PROOF GUN WAD FOR mild recoil close even pattern unusually long range, $4.00 per M. Packed in 1000 lots 500-⅜, 250-⅛C, 250 thin c, send remittance. E. G. Snyder, Rt. #2, Reading, Penna. tf

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AMMUNITION—NEW AND USED SHOTGUNS, Rifles, Handarms. List 10¢. Dept. N. R., Rudolph's, Atchison, Kansas. 12-46

COLT, REVOLVING RIFLES, CAP AND BALL revolvers, Kentucky rifles. List 10¢ stamps. E. C. Ward, 604 No. Verdugo Road, Glendale 6, California. 12-46

U. S. MILITARY FIREARMS, 1776-1946. BASIC book for collectors, illustrated by 88 full page plates, price $6.00. James Hicks, 428 Rich, Mount Vernon, N. Y. 12-46

PISTOL AND RIFLE SHOOTERS: IT'S TIME TO shoot for the sport of it again, so we are back on the job making your favorite KURVE-KUT TARGET PASTERS. Ask your dealer or write direct to us. Razorback Target Pasters, Fayetteville, Ark. 1-47

ILLUSTRATED 172 PAGE CATALOG OF ANTIQUE firearms and edged weapons 50¢. Robert Abels, 860 Lexington Avenue, New York 21, New York. 1-47

REVOLVERS, MINERALS, STAMPS, COINS, glass. Indian relics, catalog 5¢. Cowboy Lemly, Las Cruces, New Mexico. tf

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INVENTORS WRITE FOR FREE BOOKLET EXPLAINING how you may secure greatest profit from your hunting, fishing or other sports inventions, patented or unpatented. Institute of American Inventors, Dept. 131, 1926 Eye St., N. W., Washington 6, D. C. tf

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U. S. ARMY LEATHER RIFLE SLINGS USED 1¼", good condition, $9.00 per dozen in dozen lots. Samples $1.00 each. Sportsmen's Supplies, 250 West Bayberry Lane, Upper Darby, Penna.

P.38, RADOM, NAMBU, BERETTA, 380 Browning, P-37. Excellent with holsters, $50.00 each. Many others, long and short, modern, percussion and flints. Write wants. W. J. McGraw, 1549 South 39th, St. Louis 10, Missouri.

Help a friend— and yourself!

Many essential items of shooting equipment are still hard to get—and probably will be in very short supply for months to come.

Tens of thousands of your fellow sportsmen can do little or no shooting because of the possible lack of only one or two needed items of equipment.

If you have ANY surplus or duplicate equipment you don't need right now, we urge that you make it available to fellow shooters for their immediate use.

Perhaps *you* need something also—which might be secured thru an attractive "trade." So send us your classified ad copy, immediately, for the next "Arms Chest."

Final closing date for February issue is January 1st. See above for full instructions.

NEW RATE, 20c PER WORD: Beginning with the April 1947 issue the classified advertising rate will be advanced to 20¢ per word. This increase has become necessary because of much higher publication costs, and the greatly expanded circulation of the RIFLEMAN. Print order for this issue will be in excess of 210,000—and present rate of 15¢ per word was established when circulation was less than 90,000.

Here's the making of a

MERRY CHRISTMAS

for any target shooter

The Mossberg "SPOTSHOT" clearly defines .22 cal. bullet holes at 100 yards. Used and recommended by experts.

"Spotshot" $22.30
Stand 9.95
COMPARE!

20-power, achromatic objective lens 38 mm. in diameter, ground to one hundred thousandth of an inch. Eyepiece lens is 10 mm. Micrometer adjustment for focus. Field approximately 7½ feet at 100 yards. A really fine instrument at a typically sensible Mossberg price.

"SPOTSHOT" Stand, *newly improved.* Legs and upright fold to 10" x 3¼" x 3"; weighs only 2¼ lbs. Both horizontal and vertical screw adjustments. Won't tip forward. Usable for all makes of spotting scopes. Handsome black crinkle finish.

Your firearms dealer has the "SPOTSHOT"—or can get it for you. NO SALES AT FACTORY. Free, descriptive literature on request

O.F. Mossberg & SONS, INC.

62512 St. John St., New Haven 5, Conn.

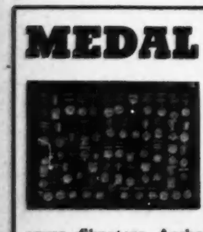
MILITARY CONVERSIONS

in most popular calibers. Sporter Stocks fitted, scope or iron sights mounted on your Mauser, Springfield or Enfield action. Winch. .52 made into sporter models to your specifications. All types of repairs. Prompt service and quality workmanship by experienced gunsmiths.

THURMAN RANDLE & CO.

208 N. Akard St. Dallas 1, Texas

MEDAL CASES



Genuine Walnut frame beautifully finished. Glass front. Black or Maroon velvet background. Three stock sizes. Reasonably priced at $3.50, $4.70 and $5.90 f.o.b. Neenah. Make ideal gifts for Veterans, Shooters, Archers, etc. Free descriptive folder.

Order early for Christmas

H. C. NIELSEN 630 Congress Street
Neenah, Wisconsin

MILLER & NORMA BEDFORD

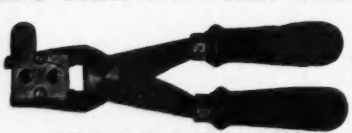
World's Rarest Guns at

New London, Ohio

take this opportunity to greet all their thousands of personal and close friends throughout America and in foreign lands and to wish all of you superb folks the best possible and happiest of Merry Christmases and all the good things that the New Year of 1947 can possibly hold for you. We make this announcement because sending Christmas cards to all you hundreds and thousands of pals and really close friends will be impossible. May God give you the best He has on hand.

Norma and Miller

BOND DOUBLE CAVITY BULLET MOULD



ALSO NOW AVAILABLE MODEL "C" LOADING TOOLS. ALLOW TWO TO THREE WEEKS FOR DELIVERY

Send 10c for latest catalog on hand loading

MODERN-BOND CORP.

813 West 5th St. Wilmington 99, Del.

SPORTING TYPE GERMAN TELESCOPE mounts with bases, unblued, never used, $25.00 each postpaid. 4xR Ruess, Berlin scope sight, case, used, $45.00. Beautiful, engraved, 8mm. double hammerless, Krupp barrel rifle, Circassian stock; 20 ga. Sauer, hammerless ejector, Krupp barrel, three barrel hammer, cartridges; 8mm. x16 over & under Sauer hammerless; 7mm. x16 over & under Richard Marholdt, Innsbruck Bohle barrels, original low mounted 4X Hensoldt, fancy engraved, 8mm. x12 double hammerless combination, Krupp barrels; 12 double hammerless Krupp barrels; Heym 9.3x72 double rifle with 16 ga. 3 barrels, Krupp barrels cartridges; 8mm. x16 three barrel, Krupp barrels; over & under hammerless 12 ejector Gastinne Renette, Paris; 8 ga. Woodward hammer, breech loader, locking tools, accessories, Trunk case, Commonwealth Pennsylvania Flintlock; Porter revolving rifle; fancy engraved presentation 1866 Winchester; another plain; L. C. Smith three barrel gun; 8mm. Lebel carbine, 8mm. Lebel rifle 1916, needs stock African Rhino Head; Boars Head; Old ship models; Akeley 35mm. moving picture cameras with Carl Zeiss, Bausch & Lomb regular and telephoto lens, magazine, cases, tripod, cost about $4,000.—DeVry Projector all former property Capt. Bob Bartlett the Explorer; 6x32 Abercrombie & Fitch binoculars; 8x32 Wide angle G. Fournier, Paris binoculars; Carl Zeiss prismatic German Army double periscope type battery commanders glass on tripod; U. S. Army prismatic periscope; French Army prismatic periscope. Send for list quoting prices. Trade for antique or modern guns; Want Damascus barrel shotguns. Personal Calls 10 A.M. and 4 P.M. or by appointment any hour. V. Vincent, % Antique Shop, 252 East 52nd Street, New York City, N. Y.

HAVE FEW 3 STAR WOODS DOWN FILLED sleeping bags. Also some Polar Arctic down filled bags, slightly used. Not the inferior down and feathers, $35.00 each. Certified check or M.O. Frank Manuel, 124 6th Street, S. E., Washington, D. C.

COMPLETE MODERN GUN SHOP AND MODern 5 room stucco home on large lot. For information write to Jacks Gun Shop, 416 So. Myrtle, Monrovia, California.

STEER HORNS FOR SALE SIX FOOT SPREAD, polished and mounted. Free photo. Lee Bertillion, Palestine, Texas. 1-47

SAUER MODEL 38 DOUBLE ACTION 7.65 AUtomatic, beautiful blue finish. Mauser H Sc 7.65 nickle plated with ivory grips, both guns perfect and as described in January 1945 Rifleman. Both for $110.00. Frank Bell, 8331 Kostner, Skokie, Illinois.

THE KENTUCKY RIFLE—PRODUCT OF AMERican genius, born of necessity, it astonished the world with its accuracy. It won the Revolutionary War and secured our Frontiers. Made in small back country gunshops with primitive tools, it emerged a truly unique American weapon. Its graceful lines and stocking of tiger flame maple make it wonderfully decorative. We have just purchased an outstanding collection and are offering these pieces of Americana priced from $75.00 to $175.00. Kimball Arms Company, Woburn, Mass. tf

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AMMUNITION, 1000 ROUNDS CALIBER .50 RIM fire, black powder, for Spencer carbine or Peabody, $15.00 per hundred. 800 rounds caliber .50 center fire, for Remington single shot rifle, black powder, $15.00 per hundred. Remington S.S. carbine & Spencer carbine, calibers .50, perfect shooting shape, for above ammunition, $30.00 each. Luger 9mm. nickel, 4½", excellent, $40.00. Polish Radom, 9mm. blue, excellent, $40.00. Details by letter. J. D. Conklin, State Theater, Radford, Va.

HOLIDAY GIFT PACKAGES. TANGERINES half bushel package $3.50 prepaid express. O. L. Stroman, Mission, Texas. 12-46

DEALER & COLLECTOR: WORLD-WIDE FIREarms publication, $1.00 yearly; foreign $2.00. Dealer & Collector, 71 SM, Flushing, N. Y. tf

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JACKET BULLETS—.22 45 GR. S.P. $2.25 PER 100. .22 50 gr. O.P. $2.50 per 100. .22 55 gr. S.P. $2.50 per 100. .22 Savage Hi-Power S.P. $2.50 per 100. .257 71 gr. S.P. $2.50 per 100. .257 87 gr. S.P. $3.00 per 100 .257 100 gr S.P. $3.00 per 100. .256 Newton 100 gr. S.P. $4.00 per 100. .256 Mann. 100 gr. S.P. $4.00 per 100. Immediate delivery. Modern Gun Shop, 125 Dawes Road, Toronto, Ontario, Canada. 12-46

.45 COLT S.A. PARTS; USED, GOOD SERVICEable order: trigger $1.00; hand with spring $1.50; ejector head $1.00; hammer $2.50; trigger guard $2.50; screws 25¢ each. .45 ACP barrels, good $2.25. .38 ACP magazines $2.25. 20 shot magazines for 30-06 Springfield $6.00. .22 (short) supplemental chambers M1903 Springfield $1.25 each, 6 for $6.26. Antique pistol capper $7.50. B. K. Wingate, 470 Parkway, Trenton, N. J. 12-46

EMBLEMS
G. O. WOOD
124 Ontario St., Lynn. Mass.

IDEAL CHRISTMAS GIFT! "THE GUN DIGEST": Biggest selling gun book ever published and its companion volume, "Fishing Tackle Digest": Encyclopedia of fresh water tackle demanded by thousands and now released for the first time. "The Gun Digest" is the one-andonly authentic guide to American and Foreign rifles, shotguns, handguns and accessories. Every current American model is brilliantly illustrated, fully described. 164 pages, 25 sections! 750 illustrations! "Fishing Tackle Digest" is the bible to all popular rods, reels, lures and accessories. Complete specifications and hundreds of illustrations of all tackle now being manufactured for both fly fishing and bait casting. 16 experts reveal their secrets on selection, use and care of tackle. 140 pages, including special 8 page insert in gorgeous natural color featuring flies, baits, game fish. Both great books (giant 11" x 8½" size) in Christmas package only $2.50 postpaid ($3.00 in Canada) or either book only $1.25 ($1.50 in Canada). Send us your list of friends and we will wrap and mail them individually for you at no extra cost. Send check or money order today. Money Back Guarantee. Klein's Sporting Goods, 229 E West Washington, Chicago 6.

EMPTY SHOTGUN SHELLS $3.50 PER THOUSAND. Large Gun list 10¢. Geo. Brullesauer, 3957A Castleman, St. Louis 10, Missouri. 12-46

ALWAYS A GOOD STOCK OF COLLECTORS arms and visitors always welcome. House of Guns, 34 Alpine Place, Kearny, N. J. 2-47

ANTIQUE FIREARMS CATALOG FEATURING the Price, Waid and other collections of Kentuckies, Militaries, Colts and other handguns and accessories, 25¢. T. J. Cooper, Port Royal, Penna. 2-47

FRENCH MILITARY ISSUE RIFLE, NEW model MAS 36 cal. 7.5mm. with bayonet, 20 cartridges, v.g. $37.50; French 8mm. issue carbine, good to v.g. $22.50; Italian issue carbine 6.5mm. Golding bayonet, almost v.g. $25.00; Czech. military Mauser rifle, as issued, 24" barrel, 8mm. v.g. $37.50; Jugoslavian Mauser as issued, 24" barrel, 8mm. v.g. $37.50; Nazi issue snipers' Mauser rifle, with 4X Ajax scope, v.g. $125.00; Nazi semi-automatic rifle, 8mm. GEW 43, v.g. $40.00; another complete with issue telescope $90.00; Danish Krag issue rifle, 8mm. good to v.g. $45.00; Nazi Mauser issue rifles, good to v.g. $30.00; v.g. $35.00; Springfield 30-06 military, stock cut at band, low number action, bore excellent $45.00; Following automatics, good to v.g., $32.50 each; Walther P.38, Polish Radom, Belgian 13 shot Browning, Walther PP .32 ACP; Luger 9mm. good $32.50; Browning model 1922 caliber .32 ACP, v.g. $25.00; No COD, money refunded if not satisfactory. Martin B. Retting, West Hurley, N. Y.

ONE 32" BARRELS VENTILATED RIB OVER and under trap gun, single Miller trigger, selective, engraved, fine checkered pistol grip and fore grip. Made by GEBR. Adamy, Suhl, Germany. A prewar gun bought from sole U. S. Agents Sloans Sporting Goods Co., New York. (Diamond Grade) no scratches or blue wear, a beautiful piece, price $600.00. Perfect. One Colts (Bisley Model) 32 W.C.F. few minor pits in barrel otherwise perfect, about 50 rounds $50.00. One Colts single action Army, .38 caliber special, minus trigger spring, very good $40.00. One Savage model 99 caliber, .300, 330 Weaver scope, Stith mounts and about 50 rounds, factory new perfect $175.00. One P.38 50 rounds perfect $80.00. One U. S. Springfield model 1884-45-70 good or better $45.00. Two U. S. Springfields 45-70 1873 good $30.00 each. One Marlin Ballard Schuetzen, fish belly stock and prone stock, double set triggers caliber 25-25 about 40 rounds, very good to excellent, $125.00. J. P. Varnick, F.B.I. Academy, Marine Barracks, Quantico, Virginia.

AMERICAN RIFLEMAN BOUND COPIES 1923 through 1943, mint $125.00; S&W model 91 excellent $50.00. Robert W. Knight, Seneca Falls, N. Y.

CHESTERSITE, THE NEW SIGHTING RIB FOR scopes is now adapted to shotguns. Converts your double, automatic or repeating shotgun into an excellent big game killer when used with rifled slugs in light to heavy cover when accurate, smashing, paralyzing blows are needed. Send for folder. Chestersite, Dept A.R. Oakwood, Ohio.

.22 CALIBER AMMUNITION SHORTS, LONGS, $10.00 per 1000. Long rifle $7.50 per 500. .38 S&W, .38 special cartridges, $6.00 per 100. .45 Remington Colt auto. shells $10.00 per 100. John Christopher, Dept AR, 220 West 42nd St., New York, N. Y.

.38 COLT POSITIVE, POLICE SPECIAL, PERfect condition; two boxes ammunition; price $50.00. H. F. Buckman, 2105 No. Glebe Road, Arlington, Virginia.

WINCHESTER 12, 12; EXCELLENT PLUS, $65.00. E. F. Brandt, Box 11, St. Augustine, Florida.

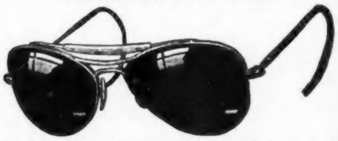
BLACK POWDER For Muzzle Loaders. FFg, US Army-Western. IMPROVED. Very Best. Drum, 25 lbs., $9.50, FOB, by freight. Miller Bedford, New London, Ohio. Good Wholesale price to dealers.

GIFTS ALL SHOOTERS LIKE

LOADING TOOLS

Many tools are back in stock, few require much waiting. Potter "Gem" $28.00 to the Automatic Duplex $62.50. Furnaces $15.00, $17.00 & $19.50. Pacific Super $34.50—Std. $27.50. B & M M/28 in stock for most calibers $19.50; Lyman Tru-Line $22.00; Meepos $30.00; Speedlubes $18.50.

SHOOTING GLASSES



Precision ground lenses, gold filled frames, plastic brow rest feature this excellent goggle. The color is the well-known green shade so popular with target shooters and general outdoor wear. MONEY BACK IF YOU AREN'T SATISFIED.

Mitchell, large, with bar	$11.50
Mitchell, large, without bar	10.00
Mitchell, ladies', without bar	9.00
Mitchell, large, with bar, white metal	7.60
Mitchell, large, without bar, white metal	7.00
Shuron's Sunrex, rimless, large	12.75
Shuron's Sunrex, rimless, ladies'	12.75
A. O. Calobar, large, with bar	9.50

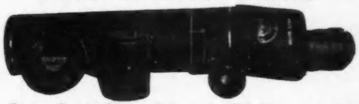
RAY BAN SHOOTING GLASSES IN STOCK!

Large Size Shooting Glass, with metal case	$15.00
Regular and Small Size Ray Ban Glasses, in both #2 and #3 shade	9.75

BEST OF ALL—*NO WAITING*

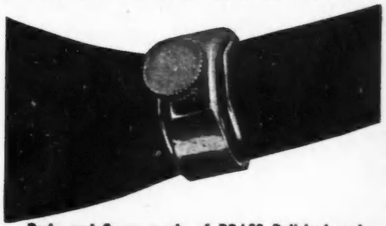
for your order to be shipped or an answer to your letter! Of course, we don't have everything you want yet, but we'll send what we have and tell you when to expect the rest BY RETURN MAIL!

ARGUS SPOTTING SCOPES



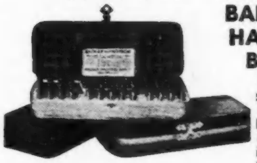
Super Grade 55mm Prismatic $74.50, postpaid (supply limited).

BADGER SLING KEEPER $1.00



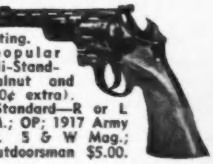
Body and Screw made of BRASS Polished and Nickel Plated—won't wear out! DOUBLE your money back if you can make it slip!

BADGER HANDY BOX



Made of select butternut, holds 50 cartridges in rows of 5s for easy count plus space for a full box in center. Dope sheet in cover gives elevations. Price, postpaid $1.25

POINTER PLASTIC STOCKS



Shaped to fit hand, thumb rest, oil and acid resisting. Made for most popular Colt, S & W and Hi-Standard models. Walnut and Ebony or Ivory (50¢ extra). Woodsman & Hi-Standard—R or L $5.50 Colt PP; O.M.; OP; 1917 Army Camp Perry $5.00. S & W Mag.; "K"; M & P; Outdoorsman $5.00.

Prices subject to change without notice. Orders filled at current prevailing prices of manufacturer.

Send for FREE catalog and current "Headliner"

BADGER SHOOTER'S SUPPLY

Owen ***"Lew" Bulgrin*** **Wisconsin**

"SURE WE TRADE"

SHOOTING AND SPORT GLASSES

CALOBAR, RAY-BAN NOVIOL

$3.00 to $12.50

Also Ground to your prescription

Write for free folder

STERN OPTICAL COMPANY, INC.
1234 Lexington Ave., New York 28, N. Y.

LEATHER PANTS & JACKETS

SHEEPSKIN LINED

Original U.S. Air Corps issue: pants, $10.00, jackets, $18.75. Soft seal brown leather. Fine sheepskin lining. Zipper front, adjustable wide elastic suspenders on pants. Warm, lightweight, wind-rain proof. All sizes. Ideal for sports and outdoor work.

Satisfaction guaranteed

NEW YORK CLOTHING CO.
Dept. 123, 2079 Second Ave. New York 29, N. Y.

CUSTOM GUNSMITHING

Fine Sporters from Military Rifles
Excellent Stocks, Bluing

Stamp for Folder

La CROSSE GUN SHOP
1932 Loomis St. La Crosse, Wisconsin

RUSTEPRUFE

A Nitro-Solvent and Rust Preventive in one application. Prevents Rust in any climate for indefinite periods of time. Used and endorsed by leading Shooters. Sold at Hardware and Sporting Goods Stores throughout the country.

WRITE FOR FREE PAMPHLET ON GUN CARE — RUSTEPRUFE LABORATORIES · SPARTA WIS.

Convert your Mauser M'98 to a Sporter

FOR ONLY **$25.00**

OTHER ATTRACTIVE OFFERS

Muzzle Brake. Furnish and install Johnson Muzzle Brake—improves accuracy, 40% less recoil.

Price: $9.00
Check here ( )

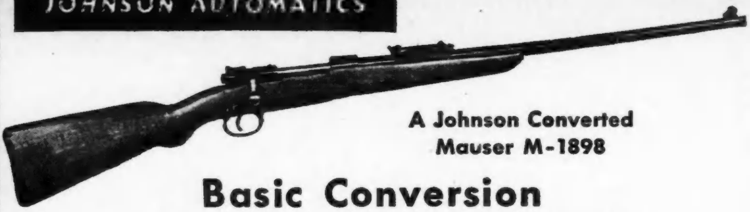
Front and Rear Sights. Remove original sights and base. Furnish and install Lyman ramp band front sight and Lyman No. 48 rear sight.

Price: $22.25
Check here ( )

Use this ad as your order form. Check √ work you want done in boxes above—forward this ad with your rifle to us.

Name ....
Address ....
City .... *State* ....
The Number of my Rifle is
....

JOHNSON AUTOMATICS



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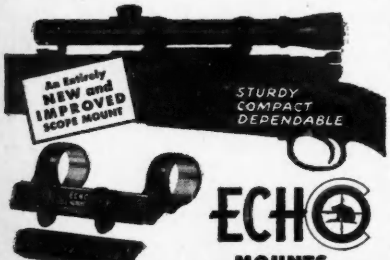
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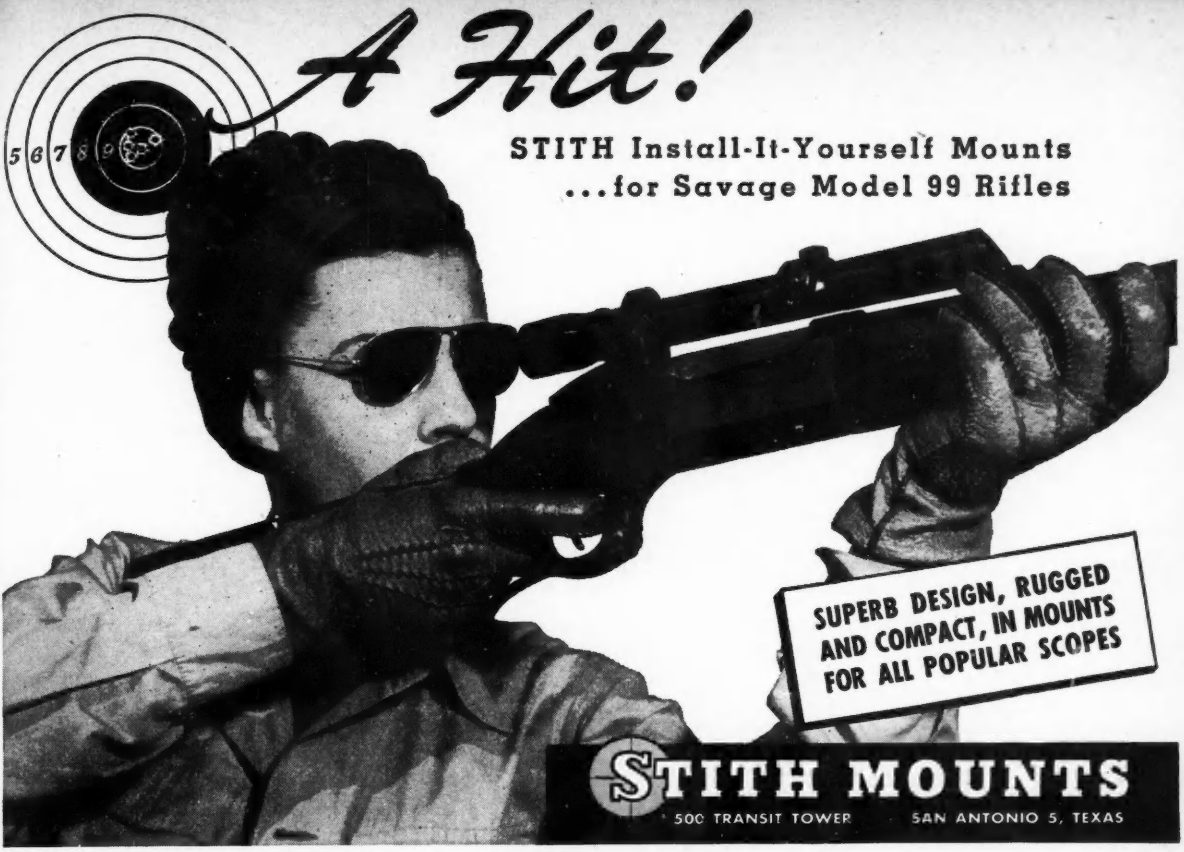

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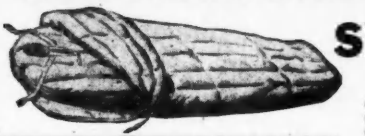

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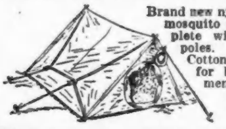

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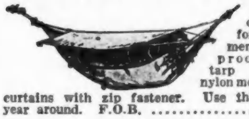

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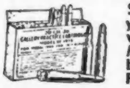

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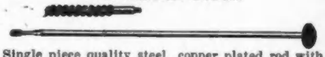

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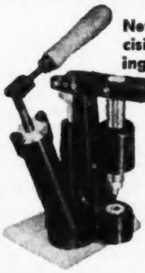

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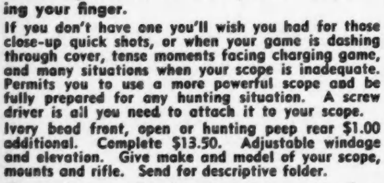

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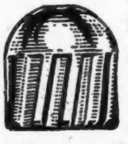

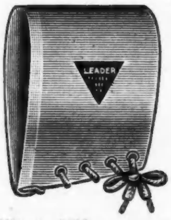

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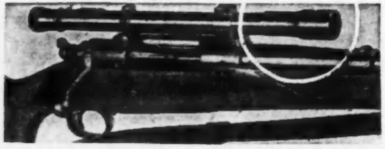

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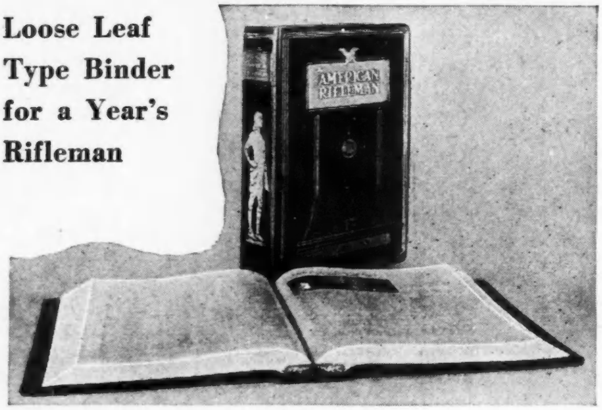

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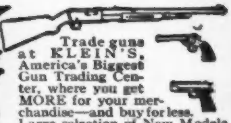

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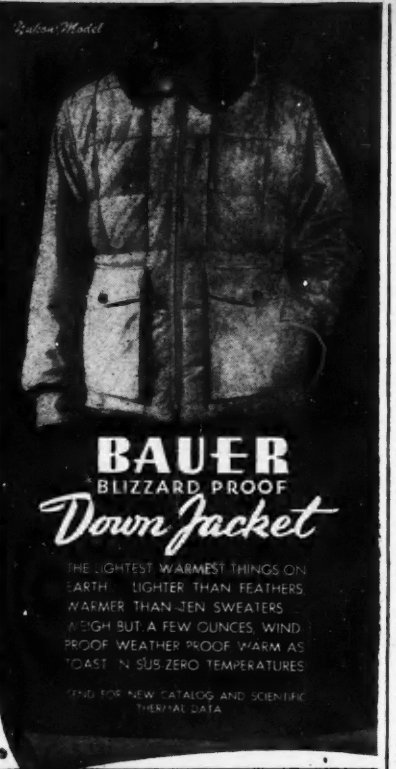

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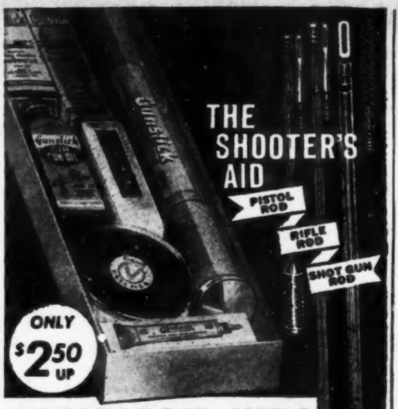

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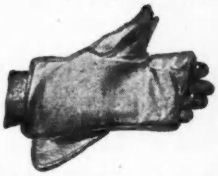

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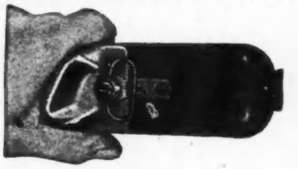

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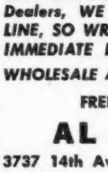

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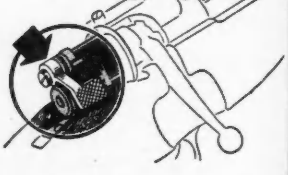

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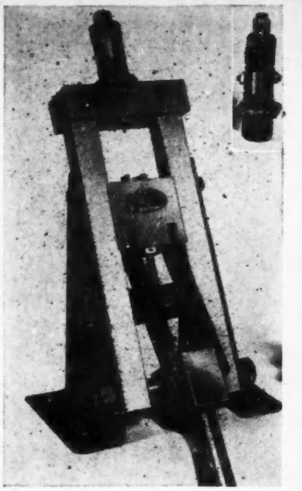

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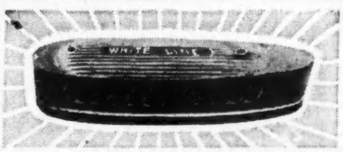

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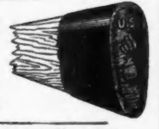

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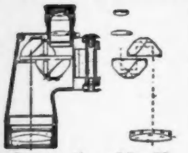

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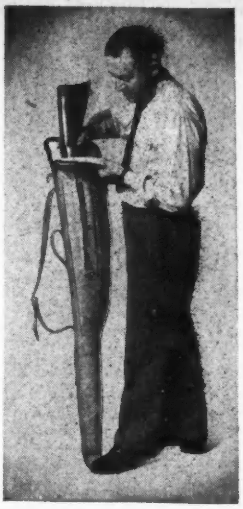

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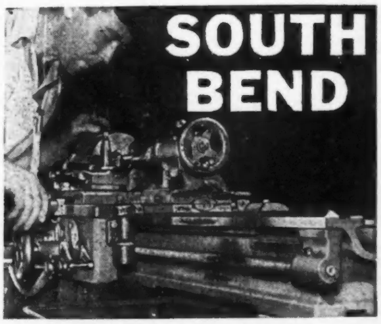

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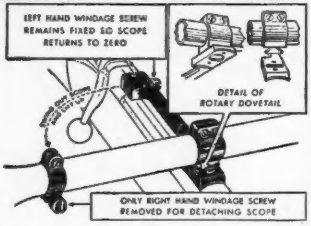
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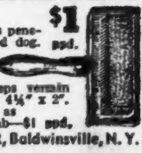

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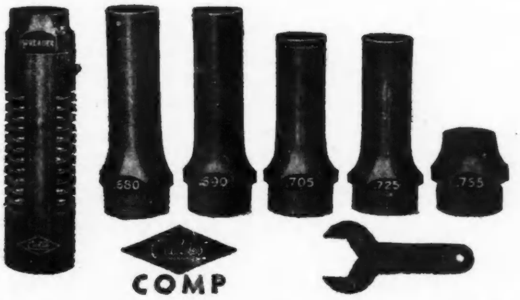

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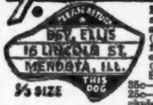

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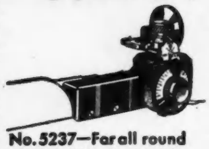
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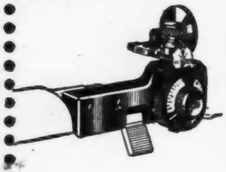
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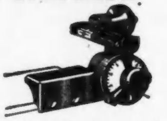
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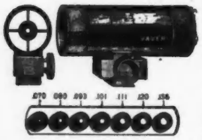
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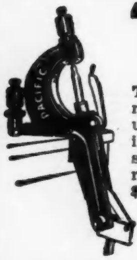

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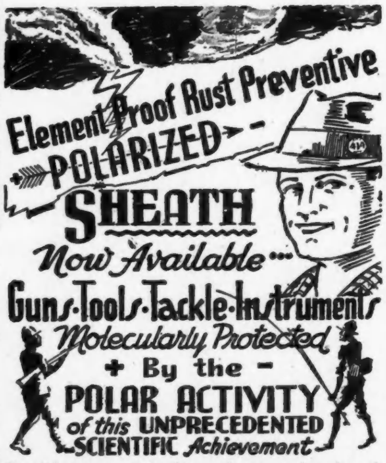

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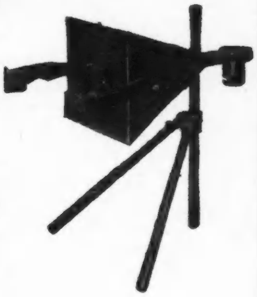

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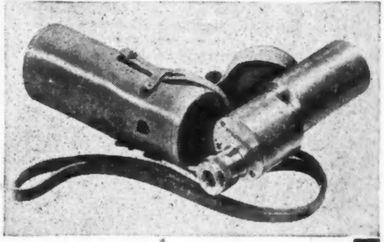

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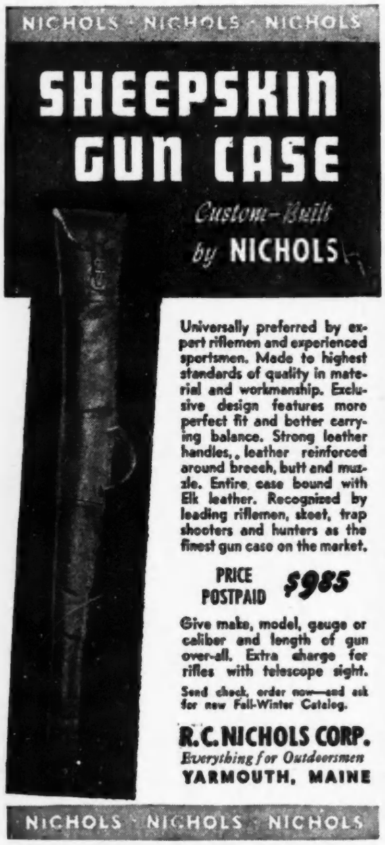

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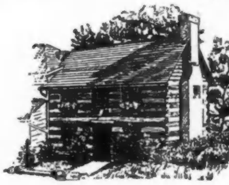

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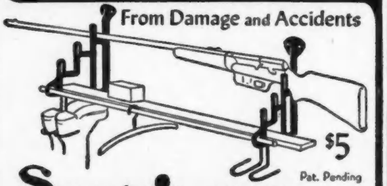

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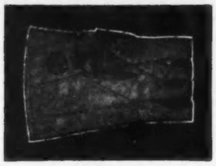

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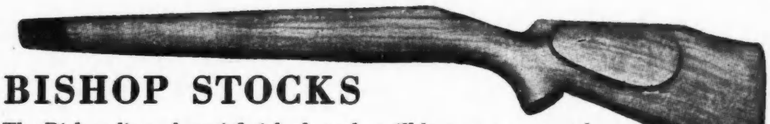

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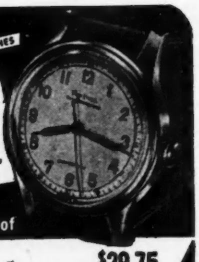

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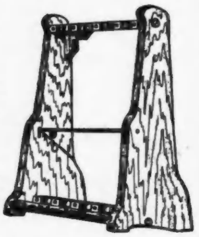

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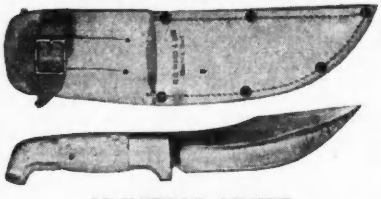

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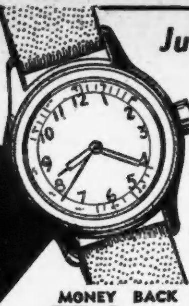

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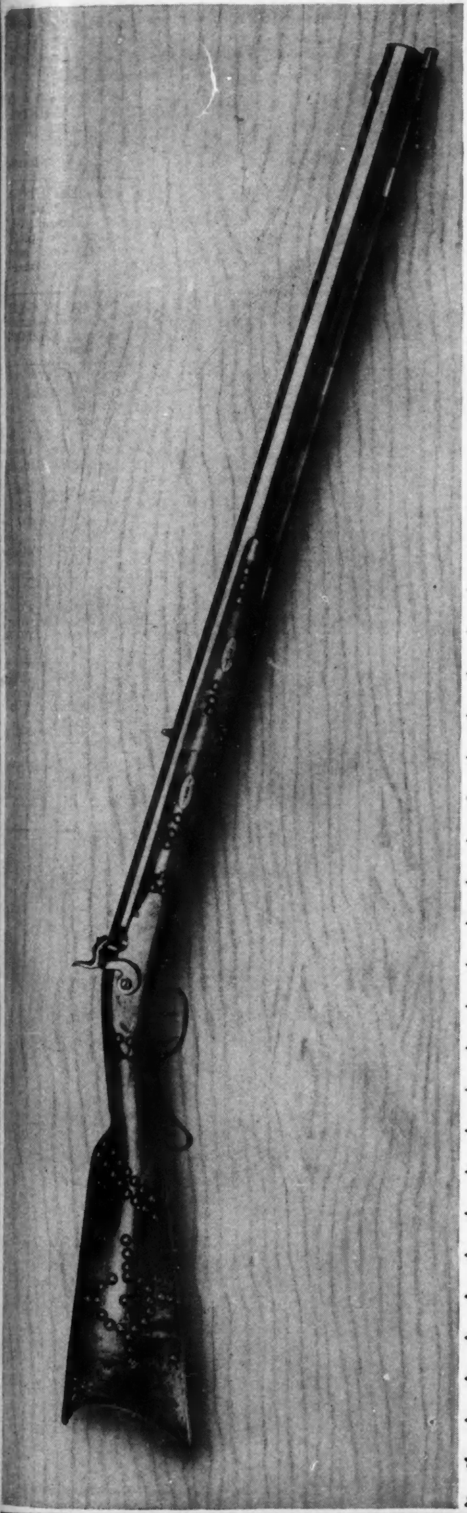

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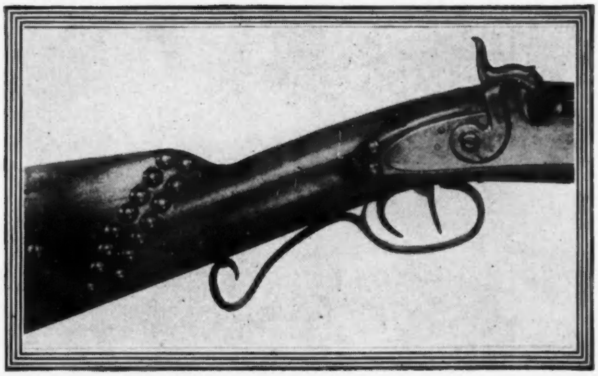

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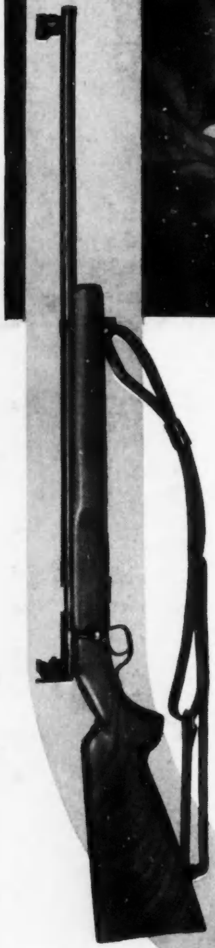

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